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***Military Affairs
Defense Industry and Conversion***

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Central Eurasia

Military Affairs

Defense Industry and Conversion

JPRS-UMA-93-015

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11 May 1993

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Deputy Defense Minister Kokoshin Interviewed
PM2001145193 Moscow IZVESTIYA in Russian
19 Jan 93 p 5

[Interview with First Deputy Defense Minister Andrey Kokoshin by Viktor Litovkin; date and place of interview not stated: "Military Help Industry, Defense Industry Workers Help the Army"—first paragraph is introduction]

[Text] IZVESTIYA military observer Viktor Litovkin talks about Russia's military-technical policy with First Deputy Defense Minister Andrey Kokoshin.

[Litovkin] The military department's "portfolio of orders" has been formed for 1993. It has been approved by the government on a larger scale than for 1992. Why is this?

[Kokoshin] Last year the reduction of the expenditure on weapons and military equipment was about 68 percent compared with 1991. It was dictated by financial and economic considerations. You must remember that decisions on these questions were taken in December 1991 under extraordinary conditions. For a whole series of salients, purchases of weapons and military equipment had been reduced to virtually nil. Many types of weapons and spare parts and instruments, including the most essential, had virtually ceased to reach the troops in 1992. By comparison with the period of the early eighties, when defense expenditure was obviously excessive, we found ourselves in the diametrically opposite position.

For several types of military output the leap in price was far more substantial than for civilian machine building and instrument building. This was largely determined by the artificially lowered prices in the past for many components and materials for the defense industry. As a result there was a drastic change in the correlation between expenditure on the maintenance of the armed forces on the one hand and purchases of weapons and military equipment and scientific research and experimental design work on the other. Whereas in the late eighties the correlation was approximately 3:2 in favor of purchases of weapons and scientific research and experimental design work, now the correlation is approximately 3:1 in favor of expenditure on maintaining the armed forces. That is connected, inter alia, with the greater emphasis on the army's social needs.

The level of production of most types of weapons has declined so far that it has become unprofitable for enterprises and we have come up against a rising tide of refusals of defense orders by enterprises. The threat of the disappearance of a large part of the defense industry has arisen. Yet the defense industry is the main resource for our competitiveness in the world hierarchy of developed states. In terms of the quality of engineers, scientists, and workers working in it and in terms of labor discipline and many dual-purpose technologies.

[Litovkin] Andrey Afanasyevich, is the quantity of weapons already produced not enough? According to experts' assessments, for instance, we have more tanks than the rest of the world put together and one of the main causes of explosions and fires at arsenals is the violation of storage rules because of the excessive number of shells.

[Kokoshin] You must bear in mind that a very substantial proportion of the new equipment in the possession of the USSR Armed Forces has remained on the territory of Ukraine and Belarus. A considerable proportion of what was transferred beyond the Urals back in the late eighties was stored in bad conditions. Therefore although as a whole stocks of arms in Russia are considerable, the proportion of obsolete weapons, ineffective in combat terms according to modern world standards and expensive to operate is considerably higher. We must resolutely rid ourselves of obsolete weapons and of obsolete ammunition and utilize them. This is a labor-intensive and sometimes expensive process which, in addition, requires special safety measures. Expenditure on these purposes are also included in the "portfolio of orders for 1993." Here it is planned substantially to reduce the number of types of systems coming into service. So, in forming the order for 1993, we sought to ensure the provision of the Armed Forces, at least at a minimal level, with the most modern weapons.

[Litovkin] What priorities were at the basis of this policy?

[Kokoshin] One of the main ones was the provision of adequate combat and transport facilities for the mobile forces, which could be used promptly and resolutely on any threatening salient. The order provides for purchases of the relevant transport aircraft, transport and combat helicopters, artillery, armored vehicles, and other military equipment.

Another very important priority is the maintenance at the proper level of the strategic nuclear deterrent forces as the main means of preventing a world nuclear and conventional war. It is planned primarily to step up efforts to develop combat planning and communications systems greatly increasing the effectiveness of the nuclear deterrent forces and their reliability. Nor can we leave unattended the provision of Russia and our allies with a reliable system for warning of a missile attack and monitoring space.

It is very important for us to have priority which not only relates to strategic nuclear forces but also pervades all branches of the armed forces and categories of troops—that means systems of reconnaissance, warning, combat control, communications, and electronic warfare. By investing funds and organizational efforts here we are seeking to boost the status of this entire group of technologies—from scientific research and experimental design work to the level of purchases. These funds are a multiplier, an augments of the combat potential of weaponry.

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If we are speaking specifically of electronic warfare facilities, it must be noted that many of them are in need of updating, while others are simply in inadequate supply. And the struggle for dominance in the airwave today is almost the main sphere of the struggle for dominance on the battlefield. I support those specialists who believe that electronic warfare has been transformed from a backup facility into a combat weapon system.

Many elements of the development of the system of combat control, communications, reconnaissance, and electronic warfare could be used as dual-purpose technologies. The foundations for the development of these facilities must be used with the maximum effectiveness to the country's economy in the systems of telecommunications, remote-control probing, the protection of commercial secrets, and so forth for which there is an enormous demand in Russia today.

But in orders for ammunition emphasis has been placed primarily on high-precision weapons with selective strike properties.

[Litovkin] Weapons take more than a year or two to create, throughout the world work on weapons systems takes 10-15 years. Tomorrow's technologies and work in hand are already required today. How to reach them if our lag behind the developing countries is increasing with every passing year?

[Kokoshin] Back in April last year we formulated the long-term aims and tasks of military-technical policy considering acute problems in this sphere.

This policy should ensure the development of the Russian Armed Forces' scientific and technical base and the creation of an amount of completed scientific and technical work ensuring a basis for Russia's military industry in the long term in the 21st century and should prevent a critical lag behind the most developed countries and preserve the ability to maneuver scientific and technical resources, making it possible to level down the impact of possible military-technical breakthroughs in other countries. Russia's military-technical policy provides for the creation of very important balances between weapons systems and the military infrastructure, between new developments and the modernization of weapons, between levels of systems' combat characteristics and their operational qualities, between the development of actual weapons and their information support. All the balances which ensure real combat readiness.

We have a very modest financial potential but at the same time a large potential of accumulated technologies and most importantly of brains. In Russia there are outstanding engineers, designers, and scientists who can create technological breakthroughs even under the toughest conditions like today's. And we will do everything to support and encourage the most enterprising and talented among them who comprise the country's national pride.

[Litovkin] You have spoken several times about dual-purpose technologies. It is easy to imagine a computer which works equally well at the headquarters of a military unit and in a savings bank or communications and control equipment. But how can a Ka-50 assault helicopter or a Typhoon class strategic submarine-catamaran find an application in ordinary life? Or other similar equipment?

[Kokoshin] The development of dual-purpose technologies is a path along which the majority of developed countries are advancing today. The future of our overall scientific and technical base and primarily the civilian base and the possibility of implementing Russia's long-term national industrial policy without which we will be unable to achieve a fitting place in the system of international relations largely depend on the correct choice of priorities in the development of these technologies.

But we also need military muscles—but real and not fictitious ones, and muscles with brains. We need convincing and effective military power which would not be burdensome to the country as has frequently been the case in the past. Military might will be among the main means of ensuring Russia's security and its genuine sovereignty.

Of course, we cannot interpret the possibility of developing dual-purpose technologies too widely. In a whole series of cases only the foundations of particular complex systems can have dual application. In many spheres technological evolution in the military and civilian spheres has proceeded along completely different paths. So that you cannot make a civilian vessel out of a missile-carrying Typhoon. But many technologies developed for missile-carrying submarines, a number of authoritative Russian scientists and specialists believe, could be used, for instance, to create a whole group of means for the development of the very large natural gas deposits in the Barents Sea.

[Litovkin] Nonetheless, on the one hand you are speaking of "technological breakthroughs" and "dual-purpose technologies" and of "outstanding brains" but on the other you yourself admit that the majority of defense enterprises today are faced with more prosaic tasks—simply surviving. Conversion is marking time. There is very great social tension in the closed cities. Ties between the enterprises of Russia and the CIS countries have been broken.

[Kokoshin] We can in principle make virtually everything we need in Russia, although that will require additional expenditure and organizational efforts. In a whole series of cases a real opportunity has appeared of preserving cooperation with the defense enterprises of other CIS countries, for instance Belarus, Kazakhstan, Uzbekistan, and Kyrgyzstan.

One key question for the implementation not only of military-technical policy but also of national industrial policy as a whole is the formation of capable integrated

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industrial companies able effectively to produce both civilian and military output.

Among the "locomotives" of the development of Russian national industry I would single out primarily enterprises of the aviation and space sector. They must be given every assistance not only to survive today but also to enable them to accumulate completed work for the future.

Strong leaders have already appeared in our country for the creation of powerful diversified companies, unique, out of the ordinary people capable of organizing the production of civilian and military output, of carrying out scientific research and experimental design work, of introducing it promptly into production. The military order should be concentrated here at a relatively smaller number of enterprises. Efforts to optimize the range and combat and operational specifications of arms systems and complexes will also enable us to preserve and augment what is best to ensure the country's real defense capability.

[Litovkin] The "Achilles'heel" in mutual relations between the Defense Ministry and the military industry has always been the situation whereby the Defense Ministry leadership has often been unable to influence the selection of a particular arms system. Money for scientific research and experimental design work was in the possession of the Council of Ministers military-industrial commission, the Politburo, and the CPSU Central Committee defense industry department. Often it had to take the equipment foisted onto it or to have none.

[Kokoshin] Today the mechanism of mutual relations between the armed forces and industry is absolutely different. The Defense Ministry acts as the client of series-produced output, scientific research and experimental design work, and fundamental research. But a quite important role in forming a whole series of components of the defense order is played by other ministries, for instance the ministries of the economy and of finances. The degree of autonomy of industrial enterprises, science and industry associations, scientific research institutes, and design bureaus has increased radically.

The Defense Ministry has already prepared the basic developments for the transition from the state order for defense output to contract relations between the military department and industrial enterprises with the relevant mutual pledges.

I think that the implementation of scientific and technical policy is impossible without a consideration for these new relations.

Kokoshin on Defense Production, Conversion Measures

93UM0411C Moscow MEGAPOLIS-EXPRESS
in Russian No 4, 27 Jan 93 p 12

[Interview with Andrey Kokoshin, first deputy minister of defense of the Russian Federation, by Aleksandr Bekker, MEGAPOLIS-EXPRESS correspondent; place and date not given: "The 'Locomotives' Will Drive Russia if Russia Has Enough Fuel for Them"]

[Text]

[Bekker] From a particularly civilian person, a deputy director of one of the academic institutes, Andrey Kokoshin has become not simply the first deputy minister of defense, but also a lobbyist for the military industrial complex. How did you bring yourself to such a transformation?

[Kokoshin] During my tenure as deputy director of an academic institute, I had the opportunity to see the imbalance of many old approaches to development of armament. The defense industry turned into a sort of abscess of the economy. We needed to get rid of this abscess long ago. But we went in the other direction due to our national Russian psychology, the consequences of which turned out to be largely in direct opposition to what advocates of cutting defense spending and conversion were expecting. And we were unable to balance the budget by sharply reducing defense spending, and there is no breakthrough in conversion. As a result, the best part of Russian industry is on the brink of disaster. Like it or not, the best equipment and technology and the cream of specialists are concentrated in the Russian defense complex. It turned out that a sharp 67 percent reduction in military orders in 1992 forced our leading enterprises to be concerned primarily about survival, and often in quite simple variants. In this situation, I am trying to earn my "deputy minister" living not only by striving for a rational formation of a military-technical policy, optimal defense orders, supplying the armed forces with modern equipment in the necessary amount, but also by helping to preserve the prosperity of Russian industry, which above all means helping the leading enterprises of the defense complex in their transformation into viable organisms of a market economy. The survival of the defense industry is by no means seen as returning everything full circle—I have not met any directors of the military industrial complex who are striving for that. We all simply want a reasonable industrial policy that makes it possible to enter the market economy on fitting terms, and within its framework a more rational policy of conversion, correlated with the new military-technical policy of the Ministry of Defense and the arms program. Such a military-technical policy was drawn up last year by the Ministry of Defense. The fundamentals of the arms program up to the year 2000 have been formulated within its framework.

[Bekker] It is as if the government itself has also recognized the extreme, having allocated 13.6 billion rubles

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[R] in subsidies at the end of last year to the defense complex, and in the budget for this year defense spending has been increased to R1.6 trillion. But perhaps the government went back on its word because the military industrial complex showed who is in charge?

[Kokoshin] You know, in 1988 industry delivered to the armed forces about 2,800 tanks, and last year Russia's Ministry of Defense purchased only 20. No country has had such a drop in defense orders. For the majority of types of arms and military equipment, production has become unprofitable for enterprises. Many enterprises are turning down defense orders. We do not need more extremes, we must preserve and multiply the country's golden reserve—the millions of skilled personnel working in the defense complex. And this is no longer a purely economic task, but optimization of the entire military-technical policy.

[Bekker] Hidden behind the streamlined formula of "optimization" is the fact that military spending in our country, by various estimates, was 25-30 percent of the gross national product [GNP]. The country simply could not endure the burden of defense spending, and it could only be a question of radical cuts.

[Kokoshin] Of course, the Russian economy incurred enormous costs for implementing a whole series of "prestigious" but little-effective programs. Highly "reportable" projects were given priority. Quite a few people in the defense complex saw this and actively, risking their careers, fought for a reasonable policy.

As far as optimization is concerned, I am now talking about it within the framework of the funds allotted by the Ministry of Defense. We are trying to preserve the most outstanding, promising achievements of the defense sector, as a rule, dual-purpose technology, which will also determine civilian technology of the future. A special program has been formed for this in the Ministry of Defense. We have also directed attention to quite practical things. For example, for communications equipment for the tactical level—squad, platoon, company, battalion, and regiment. This sphere of military-technical policy has been neglected, although communications equipment often decides the fate of a battle, and the life and death of people depend on it. This is especially true since the number of hot spots, unfortunately, is increasing. We have very acute problems with storage batteries, spare parts, and repair, where relatively small sums of money were invested before. But the top leadership has been considerably less strict in effectiveness of spending than, for example, for development of an intercontinental ballistic missile. Therefore, if we talk about the formula of military-technical policy for the immediate future, this above all is maintaining in working order that which the troops have, modernizing weapons and equipment that have proven their worth, plus creating a reliable scientific-technical reserve for the future which, when we become richer, will help us to have a small but highly equipped army where the life of each soldier will be in the price.

[Bekker] In the context of this policy, one can also examine the project, prepared under your leadership, of creating financial industrial groups, sort of "locomotives" which are to pull the entire economy of Russia behind themselves.

[Kokoshin] The idea of a national industrial policy, strictly speaking, emerged several years ago when a group of scientists and practical workers of industry began working seriously on developing a strategy for gaining a fitting place for our industry in the world markets and in the world hierarchy of developed states. We took as the basis the historical experience of Russia and the Soviet Union and the experience of transforming the military industrial complexes of the states that participated in World War II and had, understandably, quite militarized economies.

[Bekker] Relatively militarized, because the military budget in the United States was 5 percent of GNP, and in Japan it was 1 percent.

[Kokoshin] That is now. But when Japan left the war, practically its entire economy was working on "weapons." But the Land of the Rising Sun used its resources very efficiently, creating a long-term phased system of gaining a fitting place in the world economy. It was the same in Germany, Italy, and at a later stage in Spain. South Korea took a different, yet interesting path of forming primarily powerful financial-industrial groups, and then later a more extensive structure of small and mid-size business. I am deeply convinced that our historical path is largely similar to the states which had a powerful military industrial complex. And it would be absolutely wrong to split up a large part of the powerful high-tech production complexes just because they are very big. On the contrary, we had an inefficient economic-production structure even from a purely technological standpoint. In the aviation industry, which was included completely in the USSR military industrial complex, design bureaus and series-production plants have been split up and now sometimes compete with one another even in foreign markets. This is totally absurd.

Now the government, the Supreme Soviet, and the leaders of oblast and republic bodies of power have to help to create several dozen powerful industrial-finance groups which will become the main subjects of Russia's entire industrial policy. The "locomotive" theory, you know, is not new. It was used abroad for macrostabilization of financial markets or for getting out of an industrial recession. According to our estimates, the aviation and space industries, possessing the highest level of technology and a considerable potential on the foreign and, consequently, the domestic market are suited for the role of "locomotives." This is by no means a narrowly industrial or sectorial task; this is a question of Russia's supreme national interests and our place in the world civilization.

We have also proposed a program of mid-level technologies. Here the construction industry, in particular the

launching of a massive private housing construction, is promising as a "locomotive."

[Bekker] Your report, Fundamentals of Russia's National Industrial Policy, was prepared after the program of structural restructuring and hardly linked to the four priorities of the government—the fuel and energy complex, transportation, conversion, and agricultural processing.

[Kokoshin] That is not quite true. The first version of the report appeared already in early September. Let us take, for example, one fragment—conversion. In my view, we are already confusing this term. Why did the idea of a national industrial policy emerge? Because we cannot simply engage in conversion without having in mind some long-term goals in industrial and economic development and stages of reaching them. Let us say there is a program for developing civil aviation which is broken up into a number of directions. Within the framework of these sub-programs, there must be reference points given for the defense industry for exerting its efforts. Or let us take space communications equipment for civilian needs—meteorology, remote sounding from space. There is a place here for the military industrial complex, too. Another is the program for re-specializing the aerospace industry in order to develop a super-speed ground transport. I think it makes sense here to use space and aviation technologies to create fundamentally new types of transportation and other elements of the infrastructure. The same can be said for the fuel and energy complex. I have long supported the idea of creating a special state program for import replacement of equipment for the fuel and energy complex using production capacities of the defense complex. This was not some super-new idea. And quite a bit has already been done here, including thanks to the efforts of Chernomyrdin. So, our Fundamentals of Russia's National Industrial Policy are not contrary to the plans of structural restructuring of the economy or the priorities of the government, but they do, it seems to me, add a number of important additional aspects to them.

[Bekker] The proposals about relying on the military industrial complex were repeatedly talked about before you by the president's adviser on conversion, Mikhail Maley...

[Kokoshin] Maley has quite a few interesting ideas and practical work. We often argue constructively. One of the basic ideas of Mikhail Dmitriyevich [Maley] is to increase the export of weapons and through this earn fixed capital for conversion. The state leadership should devote a great deal of attention to the export of weapons and its proper organization. This should be done at the highest level, striving to implement important contracts from the governments of foreign countries. However, the capacity of the world arms market is decreasing. Therefore, weapons trade cannot be the main source of developing industry as a whole. The Fundamentals of Russia's National Industrial Policy count on powerful subjects of

the market economy—diversified industrial corporations, the bulk of whose products are civilian. But the products are high-tech, which require from the ministries, engineers, workers, and scientists the same exertion of thought that is required by the corresponding military products. In the West, civilian products are often more complex than military products; we simply have not paid attention to this trend. In our country, for example, civil aviation traditionally has developed to a considerable extent as an appendage of military transport aviation. This has cost us dearly. Nevertheless, our equipment is at a very high level for most parameters. Our isolation and loss of forward positions were sometimes compensated for by the unique findings in those spheres where our thought has traditionally developed deeply and in a nonstandard way. Here we now must direct our uniqueness at rescuing the national industry and at creating conditions for a spurt in the future, for a "Russian economic miracle."

[Bekker] Are you deluding yourself? According to data of the American Arms Control and Disarmament Agency, 85 percent of the conversion programs failed in the 1980's.

[Kokoshin] This is in America, where other mechanisms are at work and the degree of militarization of the economy was considerably less, but we simply have no place to go. Our defense industry is the heart of the entire economy. The fate of the defense industry is the fate of industry as a whole, the fate of the country if you will. If the fiasco overtakes us here, we will be cast aside to the roadside of history for decades. We simply have no other way out.

[Bekker] You touched upon a fundamental aspect: your project requires considerable tax breaks, currency support, and state subsidies from the budget.

[Kokoshin] It is not primarily a question of subsidies. Some even say that it is not tax breaks that we need, but simply organization of the entire tax system. You see, taxes are collected from enterprises, then take months to get to the treasury and often do not get there, then the money is refunded in the form of some kind of special tax credits for conversion, for maintaining cultural and communal facilities, or as subsidies for wages of the military industrial complex. Enterprises are proposing a specific plan: If an enterprise takes over social and communal facilities, the profit tax should be reduced by this amount; if a plant invests a part of its profit, it should be encouraged with a favorable tax. Thus, it is not a question of subsidies, but of a more reasonable circulation of funds between the producer and state.

[Bekker] Still, the "locomotives" will require tens and hundreds of billions of rubles. This may lead to some financial leniency and collapse into hyperinflation. Then we will no longer be in the mood for any projects...

[Kokoshin] You know, one of the specific proposals, it seems to me, is quite reasonable—determined by differentiated taxation the maximum level of profitability.

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According to some calculations, in a matter of several months this would slow down price increases and provide a certain stability over the entire system of relations between sectors. And as soon as inflation becomes at least more predictable, it will be possible to calculate the interest rate for credits. And a specific, not too high price of credit is one of the most important conditions for a successful investment process.

[Bekker] It is known that it is planned to create approximately 50 financial-industrial groups. Have you already determined the groups of enterprises which will be the "locomotives?"

[Kokoshin] I would not talk about the Ministry of Defense. It is a question of a group of persons holding the same views who have gathered together and formulated their proposals on the fundamentals of the Russian industrial policy based on a specific understanding of the country's supreme national interests. We are actively cooperating with the leadership of the State Committee for Industrial Policy and the Committee for Defense Sectors. And here we are not building speculative schemes, but are looking at who has actually approached that stage to become such a "locomotive." Sometimes it seems so on the outside, but there is no leader. Or on the contrary, there is a leader, but the chain has not formed. And here we simply get together in groups of 10, 15, or 20 people and throw this whole thing around. We are proceeding, clearly, from a reality: some have jumped ahead and begun to privatize, some have held back. So, I think that by the end of the year we will have 30-40 "locomotives."

Minister Viktor Antonov on Defense Industry, Conversion Problems

93UM0416A Moscow KRASNAYA ZVEZDA in Russian
26 Feb 93 pp 1-2

[Interview with Viktor Ivanovich Antonov, minister of Ukraine Machine Construction, Military-Industrial Complex, and Conversion, by KRASNAYA ZVEZDA correspondent Lt Col Anatoliy Dokuchayev: "Ukraine's Defense Industry Finding Its Way"; date and place not given; first two paragraphs are KRASNAYA ZVEZDA introduction]

[Text]

Biographic Sketch: Viktor Ivanovich Antonov

Viktor Ivanovich Antonov is minister of Ukraine Machine Construction, Military-Industrial Complex, and Conversion. Born in the Don area, in the city of Bataysk, he studied at the Taganrog Radiotechnical Institute. Upon graduation, he entered the military-industrial complex. He was involved in developing radar systems for the PVO [air defense] and the PRO [antimissile defense]. In 1952, he joined the Kiev association Mayak, where he worked 25 years, 16 of them as director and general director. In 1968, he left that position for the republic Gosplan [state planning committee]. He worked

as deputy, then first deputy chairman. He then assumed the post of state minister. He has been in his present position since April of 1992.

He is married and has two sons who are officers in the Ukraine Armed Forces.

[KRASNAYA ZVEZDA] Viktor Ivanovich, much is being written in the press about the defense industry. However, I wish to obtain information firsthand. How well is Ukraine's VPK [military-industrial complex] doing?

[Antonov] There was a VPK in the USSR. The very word "complex" implies that it was an integral and distinct entity. The VPK constituted a substantial part of the Union's industrial potential. It may be said that the complex ceased to exist with the appearance of the new states on the USSR territory. Various KBs [design bureaus], offices, and plants were simply taken over by Russia, Ukraine, Belarus, Kazakhstan, and other republics, with some of the latter receiving more, some fewer.

Now about Ukraine. Our republic assumed ownership of a third of the USSR's VPK. The Ministry of Machine Construction, Military-Industrial Complex, and Conversion is presently an amalgamation of 16 former Union ministries, of which nine are from the defense sector and seven from machine construction. There is a total of 3,590 design bureaus, institutes, plants, and associations.

How does the defense industry manage to exist? It has gotten to the point where in our republic there are virtually no enterprises whose work is restricted to military production. Nonetheless, in January of 1992 leaders and collectives of defense plants were shocked upon learning "suddenly" that there were no more military orders to be had. I purposely enclose the word "suddenly" in quotes, since in all of 1991 I kept explaining to directorial personnel that there would be no more orders, and, indeed, they were no longer forthcoming. From the Ukrainian Army; from the Russian Army (the latter was our greatest hope, for a large army would under all circumstances be a "consumer" of arms); or from the CIS Combined Armed Forces Main Command. It is true that we did receive an order in the middle of the year, when the republics came up with a budget, but this amounted to very little. The long and the short of it was that the military equipment production volume had undergone a reduction by a factor of 3, heralding the start of instant "shock" conversion.

[KRASNAYA ZVEZDA] So it happened that Ukraine was not prepared to undertake conversion processes.

[Antonov] Yes and no. The ministry did foresee the inevitability of initiating conversion processes, but the point here is that we were accustomed to moving very slowly before taking an action, but we were facing a matter which we could not readily set into motion. Even though a conversion ideology had been formulated. And

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in spite of the fact that Ukraine the same as other republics had to make a decision as to how to orient the defense industry.

If we were to take the first route, we could tell collectives of plants that they could continue to manufacture military equipment and export the latter, using the money earned to realign the plants. But that route does not suit Ukraine. There is stiff competition in the arms market, with the USA, England, France, China, Israel, and, yes, Russia, making themselves felt. Thus, Mikhail Maley stated that Russia would increase her exports of military equipment.

Enterprises could have been offered a second route, that of instant conversion: No orders for military equipment? Make a change to civilian production. We solicited the advice of economic experts. Their conclusion was that this particular option was also unsuitable for us. Even Poland's experience indicates that 70 percent of her industry "does not work," since we, brought up under the socialist system, cannot unhesitatingly—economically and psychologically—adopt capitalist laws, that we are even not ready to handle such details as marketing and design. We have not sufficiently matured to take on a world market, and we realize that we would not be able to withstand the shock therapy, that we would not survive long enough to see a world market. For the latter to come about, it is necessary to possess billions for industrial reconstruction; we require time for the present so that the collective does not starve to death. We hear it said: Ask for credit. But at what interest rate? 80 percent? 100 percent?

What we did was to select a third route—the Ukrainian way—one that suits us. We conducted a market survey. We identified up to 5,000 items that are needed by the consumer. We worked with the Ministry of Trade; forestry and furniture industry concerns; and with Minzdrav [Ministry of Health] departments. That is, we entered into a dialogue with 35 large wholesale purchasers. We then queried enterprises as to who would take up the manufacture of tankers, refrigerators, civil aircraft, trucks, tape recorders, freezers, etc. There were many expressing interest. We set up a competition to ascertain plants' capabilities and capacities. The winners will be awarded credit, interest-free as a rule, so that they can survive the transition period preceding initiation of production.

[KRASNAYA ZVEZDA] That must be quite expensive for Ukraine.

[Antonov] We have developed 540 conversion programs. This includes commercial space programs—we are prepared to place into orbit various payloads via the Tsiklon and Zenit rockets, and to initiate production of civil aircraft, trucks, passenger cars, and 3,500 items of agricultural implements. The cost of the programs is 600

billion rubles and 2 billion dollars. The principal implementation periods lie within the 1992-1996 time frame, with the more complex programs slated for introduction to the year 2000.

[KRASNAYA ZVEZDA] Viktor Ivanovich, conversion is a good thing, of course. But what if you are told suddenly sometime in the future that the Ukraine Armed Forces require military equipment.

[Antonov] After the implementation of conversion, production of military equipment will amount to about 4 percent of all industrial output. This is what we have estimated in our ministry. What were we to do? The military still has no doctrine and cannot provide any budget guidelines, but defense enterprises must continue to exist. Yes, it can happen that sometime in the future we will be told that there is a need for a number of items of military equipment, but our plants will have production lines set up to manufacture civilian products. But that is the present political and economic situation. It should be understood that we will retain the most essential production lines for the country's defense.

[KRASNAYA ZVEZDA] Will Yuzmash, which is world-famous for producing the SS-18 superrocket and for the fact that its general director, Leonid Kuchma, has become Ukraine's prime minister, be the least affected by conversion?

[Antonov] Yuzmash has been producing civilian products for some time; it has undergone conversion in the amount of 50 percent. It is making YuMZ tractors and trackless trolleys. As of 1 January 1992, it started to make children's bicycles, microwave ovens, washing machines, and other items. But Yuzmash has ceased producing strategic ballistic missiles. The reason is simple: No one has a need for them. It is common knowledge that Ukraine will be a non-nuclear power, but Russia is not purchasing these missiles, since they are being destroyed in accordance with the Russo-American agreements.

It should be understood that Yuzmash will continue to produce the Tsiklon and Zenit rockets, which make it possible to place a payload of 3.5 and 11 tonnes, respectively, into near-Earth orbit. To offer universal capabilities, we must have a third—booster—stage to place objects into geostationary orbit. We will do that. Ukraine is prepared to fill orders from countries of Europe, Asia, and America, with this understandably to be done in accordance with the world agreements. We do not intend to spread rocket technology.

We are working on problems associated with launching commercial payloads from Baykonur, and, in the future, with air launches, employing the Mriya aircraft, from the territory of the republic.

[KRASNAYA ZVEZDA] Is Ukraine close to becoming a space power?

[Antonov] It already is one. We have rockets, and we have satellites as well. It should be clear that we will launch them, for communications, navigation, and crop harvest estimation.

[KRASNAYA ZVEZDA] What about intelligence-gathering types?

[Antonov] I do not think that that will come about. However, if the need does arise, we should have no problems in that regard. The Zenit rocket is capable of lifting virtually any technical object into orbit.

[KRASNAYA ZVEZDA] The major consumer of rockets such as the Zenit and the Tsiklon evidently is Russia, but she can initiate her own development.

[Antonov] Russia is not presently purchasing rockets, since she has reserves stored in depots. Ways of resolving this problem have been outlined, as they have been for other problems related to mutual ties in the defense area. Little can be accomplished if close cooperation is lacking. There has been an entire year of political euphoria both in Russia and Ukraine, and this has had a telling effect on the defense industry. Now that the euphoria has passed, the political leaders have started to think, realizing that without cooperation we cannot survive.

On 13 January of this year, I met in Kiev with Viktor Glukhikh, chairman of the State Committee of Russia for Defense Branches of Industry. We signed a package of agreements relating to developing economic cooperation in defense branches of Ukraine and Russia. This provides for restoring cooperation in many areas of the military-industrial complex.

I wish to point out something. It is good to conclude an agreement, of course, but this should be followed by action, i.e., the sides should observe the spirit and the letter of the signed documents.

[KRASNAYA ZVEZDA] Does that hold true for aircraft construction as well? Information has it that the Tu-334 aircraft figured prominently in the discussion you had with Viktor Glukhikh. The aircraft is economical, while it offers as much comfort as the Boeing.

[Antonov] Close cooperation is necessary, but this is especially true in aircraft construction. The Tu-334 was developed in the Moscow ANTK imeni Tupolev. The Kiev Aviation Association is planning to manufacture it. But Russia also wishes to produce the aircraft. This is where close cooperation is essential.

The situation is the same in the case of the An-70. We wish to produce it, but Russia also intends to tool up in Samara for this multi-purpose aircraft. It has elicited much interest in the West; it can become the replacement for the C-130 Hercules, which was developed 40 years ago by the firm Lockheed. The engines for the An-70 are made only in Zaporozhye. If Ukraine does not supply them, Russia will have a difficult time of it tooling up for their manufacture.

Cooperation is also needed for the production of other aircraft. This is how we will proceed. Ukraine is to finance our KBs and plants, while Russia is to do the same for Russian enterprises, after which costs are to be shared.

[KRASNAYA ZVEZDA] Will Moscow and Kiev complete construction of the aircraft-carrying cruiser Varyag? Russians and Ukrainians want an answer to that question. Many persons are upset over the eventual scrapping of the Ulyanovsk.

[Antonov] Yes, it was necessary to cut up the Ulyanovsk for scrap, something which consumed quite an amount of means. There was no other solution. Completion of construction would have required assemblies, parts, structures, and materials from 2,500 enterprises. The breaking of ties rendered procurement impossible. It was possible to refrain cutting up the ship's hull for a period of 5 or 6 years, of course, and wait for better times, so to speak. However, the Ulyanovsk was occupying ways, and the latter are needed now to build tankers so that the shipyard can survive.

It is another matter in the case of the Varyag, which is 69-percent completed. However, even this TAKR [heavy aircraft-carrying cruiser] must be fitted with 300 combat systems. Manufacture of the latter is difficult, since some plants have been converted. For that reason, we can build the Varyag only with Russia and for Russia only. There is no other option. You hear it said that the ship should be built and sold to China. Ukraine will get nowhere by herself in this, and Russia understandably would not agree to build her for another state. An agreement will be made in conformity with the recommendations the presidents made relative to the Varyag.

[KRASNAYA ZVEZDA] Cooperation between Russia and Ukraine in the defense area is being established. Can you be certain that this will continue in the future?

[Antonov] To tell the truth, there is no complete certainty. It is true that common sense dictates that in no case should cooperation be disrupted. This would be the cause of billions in losses for each independent state. Thus, the Kharkov Machine Construction Plant can produce the T-80 tank, but Russia supplies its major armament, as she does all small arms. If Russia does not provide this armament, Ukraine will be dealt quite a blow. By the same token, Russia would also suffer a considerable blow if there were a breakdown in deliveries of Ukrainian products, say, systems for submarines. Each side would eventually manage to produce whatever equipment would not be forthcoming, of course. But would we be understood by the people who would be the ones taking on the additional burdens?

Close cooperation will enable us to maintain adequate capacities for producing modern military equipment, and, most importantly, to successfully convert defense enterprises so as to keep step with the times.

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Maley on Defense Industry's Status, Future
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[Interview with Mikhail Maley, adviser to the Russian Federation president, by political observer Otto Latsis; place and date not given: "Defense Industry: Starting To Recover from Crisis"]

[Text]

[Latsis] Mikhail Dmitriyevich, you said at a recent "round table" session that you were satisfied with the 1992 results in the defense industry, the sector of the national economy of which you are in charge. I think that many of those who heard you paid attention to these words—in any case, several speakers expressed their irritation at that same session. It is quite unusual to hear the spokesman of a major state industry positively assessing the results of a year which is so eagerly downplayed by politicians of all hues. It is even more amazing to hear this said by a spokesman of the social stratum which we dub the military-industrial complex. On what is your assessment based?

[Maley] I do not use quantitative indicators of the volume of manufactured output, even though I could refer to them. It is, after all, a fact that, at a time when everyone is complaining about the slump in production, the defense industry has large sectors producing civilian output of enhanced complexity which are going through a proper boom and are even experiencing a crisis of overproduction. This applies to the suppliers of microwave ovens, automatic washing machines, high-quality color television sets, and many other items which were in short supply until quite recently. But the main point does not concern the traditional volume indicators which hardly indicate anything during crucial periods like the present. The main point is the appearance of certain prerequisites for a future breakthrough for the better.

These are primarily psychological prerequisites. Many directors found themselves in a state of shock in early 1992, and the extrication from this state became, without any exaggeration, an important production factor. After all, the defense industry's orders were cut overnight by 60 percent at a time when, according to specialists, the optimum pace for the defense industry's conversion is not more than 6 percent per year. Only now, with hindsight, I am in a position to say: In principle, there was no other method of action in last year's conditions. The tougher decisions made at the first stage played a positive role. Willy-nilly, we reduced what had become for us a traditional initial period in any new undertaking—what I would describe as the period of head-scratching. This period is now mainly over as regards conversion, and we got over it rather quickly.

I am not saying that no mistakes were made or that all the difficulties have been surmounted. Not a single one of the economic problems of conversion has been resolved as yet, and none of them could have been

resolved in just one year. But the majority of defense industry enterprise directors no longer think that everything has collapsed or that it is impossible to survive in the new conditions, the only alternatives being either to go under or to struggle against reforms. Today most of them realize that living in the new conditions is difficult but possible, that there is no other way. They are discovering new opportunities to maintain production levels and retain cadres while adapting to market demands. There has also been another aspect of psychological adaptation. Young reformers no longer look upon the defense industry's corps of directors as a tightly-knit mass that is hostile to reforms. Both sides have learned, if not to always agree, at least to listen to and understand one another.

[Latsis] Psychological breakthrough—is this the sole ground for your optimism?

[Maley] Of course not, not the sole and not even the main ground. New forms of organization were sought throughout the year. There can be no question of restoring the military-industrial complex in its past form. But we must find organizational forms to meet market conditions. The primary concern is to retain the scientific and technical potential. A plan has been conceived to create national science and technology parks—we will evidently need about 70 of them. We have started with the nuclear industry, by creating parks in Arzamas-16 and Chelyabinsk-70. B. Yeltsin has been involved in this work from the very beginning.

[Latsis] What does this mean—is it already impossible to resolve economic tasks without Russia's president?

[Maley] First of all, this is neither an ordinary nor a routine economic task. The creation of science and technology parks is a most important task on a nationwide scale—this is the approach adopted by Western countries. Moreover, we have no precedent—this is the first time we are creating a fundamentally new organization. It goes without saying that a market economy is being built from scratch, the Russian state itself is being built from scratch. Furthermore, the president's involvement is important not only for the collectives he has met, it is important for him personally. He learned much that he did not know about what the country has at its disposal; after all, everything that was being done in these closed cities was always top secret.

Thus, when we arrived at Arzamas-16, we found out that even some of the exclusion fence around its territory has already been dismantled. Construction work had come to standstill, there was no work, and wages were among the lowest in the country. Yet the scientists treated the president with great respect and great self-respect. They had made no special preparations for the visit, everything was shown the way it was. When we saw the technical standards of research and the skills of people there, we often felt like saying: "This is unbelievable!" We also felt like saying exactly the same about their living conditions, but in the negative sense. After we left,

wages were increased severalfold. Edicts were promulgated to create these two parks. The next trip was to Severodvinsk. It is perhaps even more impressive because nuclear submarines are probably the most complex of all things created by man.

This was followed by failures. The congresses got under way, and the president no longer had an opportunity to join us in this creative work. Even the visit to the missile complex in Kaliningrad near Moscow failed to materialize. As for the piece of paper circulating within the apparatus—even though in the shape of a presidential edict—it simply gets lost in offices, in the hands of people who would like to see the old ministerial system restored.

[Latsis] So what happened—did everything stop there?

[Maley] No, things did not come to a halt but they did slow down. The president's apparatus actually elaborated a plan to create some sort of experimental showpieces of conversion which would be used to fine-tune the standard methodology for solving all defense industry problems, both economic and social. They decided to work on one microproject—a closed city-plant typical of the sector, one rayon, and one oblast. Let me tell you straightaway that nothing happened at rayon level. On the basis of objective consideration we chose Moscow Oblast's Zagorskiy Rayon, but we failed to find common language with the directors of defense industry enterprises there.

Our microproject was the artillery plant in Moscow Oblast's settlement of Balakirevo—the Ministry of Defense Industry's Balakirevo mechanical plant. It has 22,000 inhabitants, it is surrounded by a test range, and it has nothing else but the plant. There is nowhere for people to go and the settlement cannot survive without the plant—a picture that is typical of such enterprises. "Wholesale" conversion—96 percent of output, virtually total change of specialization, no orders, no funds to pay wages—this is how we started. Many people believed we would fail. Thanks are due to Vladimir Oblast Administration and the oblast's Committee for the Management of State Property—they did not give us any privileges but adopted a caring attitude and swiftly responded to any requests. The Balakirevo plant today is the first private joint-stock company still producing defense output. One category of products has been cancelled, another is being produced. Another part of the plant is preparing to start assembling the U.S. "Case" tractors. We will start by assembling and will go on to make our own components—this is the quickest way to start a new production process. The "Case" firm has 22 plants, it is dismantling finished technological lines from its plants in Britain and Germany and is shipping them over to us. The main point is that we will acquire a new plant producing an output that is most urgently needed in our market—tractors for private farmers—with the least possible expenditure of time and money.

Udmurtia became our macroproject. It is a powerful industrial region, of which people in Russia know much less than it actually deserves. Old Urals plants capable of making literally everything, as well as plants using the latest high tech developments. Defense orders account for 86 percent of all output. It also shares the misfortune of our entire industry: The social sphere is financed by the enterprises. Unless it casts off this burden, the enterprise will find itself unable to compete in the market environment. Nor can it be immediately transferred to the local budget—it lacks sufficient funds. It all boils down to sources of finance—for the plant's own output and for local budgets. If this problem is successfully resolved on Udmurtia's scale, it will mean that it can also be resolved on a Russia-wide scale.

I spent a lot of time calling on the president together with republic leaders—asking permission to export 3 million tonnes of Udmurt oil so that the republic could earn some foreign currency. We forced a decision from the center—permission to export 150,000 tonnes. I myself realize that this is the traditional way: Grab from Russia's main—and almost sole for the time being—source of foreign currency earnings the funds to finance both the center and local needs. The federal budget has as many gaps as the local budget. A decree was drafted, allowing the republic to retain 70 percent of its foreign currency earnings from arms exports. The Ministry of Finance and the Ministry of the Economy agreed without hesitation: This export of Udmurtia's was insignificant. For the time being. At the same time, if new developments are given the green light, Udmurtia's plants will be able to produce output capable of competing in the world market and worth \$1 billion a year. Being cautious, if we were to calculate on earning just one-half of this amount, this would be enough to finance both conversion and the local budget. We showed some of Udmurtia's output in Abu Dhabi—our competitors have nothing like it.

[Latsis] But our commercial successes in Abu Dhabi were not as impressive as the technical specifications of individual products.

[Maley] This is because we have never traded in arms as in normal goods. We used to market only old weapons from our Army's arsenal. This market demands a different approach, and we are perfectly able to adopt it. I have no intention of repeating myself—I spoke at quite some length about this problem in the interview which IZVESTIYA published in January. Let me make just one additional point. We do not nurture any illusions. According to my data, our defense industry's umbrella scientific research institutes and science and production organizations can confidently take only about 1.5 percent of their current developments to the world market today. This would represent only products which are certainly superior to our competitors' goods. We can only take to the market goods which are obviously superior in terms of technical and economic specifications—we will get nowhere trying to export identical

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goods, noneconomic means to struggle against competitors are more effective in the arms market than anywhere else. But even if we managed to sell just this output, Russia will have enough to finance current reproduction in the defense industry and its conversion, with something left over for the federal budget.

[Latsis] So, this scheme should be tested in Udmurtia to begin with. What have you managed to achieve there?

[Maley] To begin with—nothing. The initial plans elaborated by the president's apparatus were turned down by the republic's leaders and deputies. Serious people—why should they believe a newcomer who has only just arrived and appeared to have found obvious solutions. They thought for themselves, sought for themselves, and decided for themselves. A year has passed—I believe that this is too short a time for such work. They told me recently: This is the scheme we will apply for reform.

[Latsis] How did the production facilities survive all this time?

[Maley] Even without experiments, production does not stand still. Just one example. The Votkinsk missile plant decided exactly a year ago to set up production facilities for civilian output that really was in short supply—power units, meaning a 5.5-kilowatt minitractor. Developing an original design, superbly conceived and applied to our conditions, and setting up production lines took a year. The plant is ready to supply 50,000 machines at a very low price in 1993. As for quality—they are made the way missiles were.

The defense industry also has quite a few capacities capable of engaging in civilian production without any conversion. These are, in essence, universal capacities. The Voronezh mechanical association, for example, is doing superb work to fulfill orders from Tyumen oil workers, saving them foreign currency. Or the Lomonosovskoye Diamond Field in Arkhangelsk Oblast. Very attractive in terms of deposit quality but very difficult in terms of geological conditions, the specialists rejected all the traditional development methods. But there is also a nontraditional method, the so-called "sredmash" [reference to former Ministry of Medium Machine Building] method, which can evidently be applied. Equipment is available, free capacity is available. In many cases our defense industry enterprises can supply output to replace imported equipment and spare parts for our industry. The oil and gas industry in particular imports much of what could be supplied by our military-industrial complex enterprises. But for some reason the relevant structures in our departments do not seem too interested in such opportunities.

[Latsis] It is to be assumed that this is not due to any lack of technical knowledge. Certain interests are obviously at play.

[Maley] Of course. But there is also another aspect. There are no organizational structures adapted to the new conditions. We are facing the task of creating

market structures for the military-industrial complex. Four such structures have either been or are being created. The first of them is the Business Center, a semistate organization which could serve as a filter against numerous adventurers who have come to our country in order to fish in muddy waters, as well as helping to facilitate contacts with serious businessmen. Initial experience has already been accumulated, a "trader" has already been exposed who, as it appeared, was not backed by any serious company. The second structure is the complex's own Finance Company. A Military-Industrial Bank is being set up as part of it. In terms of registered capital it will probably rank second in the country, after the Central Bank. The succession of congresses has hindered this work, but it will be founded no later than the end of May. It will be given premises at the Moscow State University, but the university will not be the loser: The bank will commit itself to funding three faculties. The third structure—the Russian Military-Industrial Insurance Company—will also be founded no later than May. The fourth will be an information association which will make it possible to receive any commercial information regarding our industry without any delay. It would be difficult to trade without it.

The problems of the military-industrial complex have certainly not been resolved, the slump has not been overcome. But the defense industry is on its way to recovery from the crisis.

RF Armaments Chief on Impact of Payment Delays

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10 Apr 93 p 5

[Article by Col-Gen Vyacheslav Mironov, armaments chief of the Armed Forces of the Russian Federation: "The State Has Paid Off Its Debts to Defense Suppliers for 1992 and the First Quarter of 1993"]

[Text] We asked Colonel-General Vyacheslav Mironov, armaments chief of the Armed Forces of the Russian Federation, to comment on this fact. He reported the following.

The Russian Federation draft budget for 1993 has set the expenditures for development and purchase of armament and military equipment in the amount of 4.5 percent of the planned overall volume of state expenditures. For comparison, we would note, for example, that the similar indicator for the Union budget for 1991 was about 18.5 percent.

These ratios confirm the presence of a stable trend towards reducing the percentage of military spending in the state budget and, above all, a significant decrease in the volume of armament and military equipment procurement as well as in the payment for scientific technological products for defense. In spite of this, up to now we have had occasion to encounter a lack of understanding and possibly a conscious nonacceptance of the need to improve financial support of organizational

development and training of the Armed Forces of the Russian Federation, including the procurement of modern armament and military equipment for them. Unfortunately, in a number of cases, such a negative attitude towards the problems of the Ministry of Defense and defense sectors of industry is also expressed in the mass media. What is more, certain sections of the Russian public still have the opinion that the military department has unlimited capabilities in relation to financing the defense order being placed in industry. But let us look at the facts.

The 29 January 1993 decree of the Supreme Soviet of the Russian Federation specified that the Ministry of Defense was to be allocated on a monthly basis for procurement of armament and military equipment appropriations in the amount of one-twelfth of the established annual volume, and 40 percent of the annual appropriations for these purposes was to be transferred in the first quarter of 1993 for advance payment to industry for procurement of materials and component parts.

However, back in the first half of March, the Ministry of Defense did not have the necessary funds to settle its indebtedness to the corresponding producers not only for the first quarter of 1993 but even for 1992. There could be no mention of advance fulfillment of the 1992 defense order. It is understandable that such a financial situation of the Ministry of Defense not only adversely affected the work of enterprises in the first quarter but even further aggravated the social problems existing in industry.

Today, through efforts of the government of the Russian Federation, the funds necessary for financing the defense order in the first quarter have been transferred to the Ministry of Defense. The indebtedness of the Ministry of Defense of the Russian Federation for payment of deliveries of arms and military equipment during 1992 and the first quarter of 1993 has been practically paid off.

We hope that this is not simply an individual case but a hopeful sign, a harbinger of good changes in the attitude of the Ministry of Finance of the Russian Federation towards the needs of our country's defense capability. Without exaggerating, the fate of all 150 million Russians is behind this understanding, above all the highly skilled specialists, workers, and employees of enterprises and organizations of defense sectors of industry which in conditions of the constant indebtedness of the client are forced either to leave the defense sector or, adhering to their principles of life, work practically for a "thank you." Yes, they are patriots, but patriotism also requires support, and not just moral support.

In addition, it is no secret that the lion's share of the scientific and technical achievements of Russia and the

member-countries of the CIS is the result of research, developments, and technologies obtained in the process of creating armament and military equipment. That is why by investing funds in the defense sectors of industry, we thus stimulate to a considerable extent further scientific and technical progress, that is, we are doing what the emerging market so far has been unable to do. But then, the experience of economically developed countries shows that even in conditions of perfect market relations, the leading scientific and technical positions are held by firms working primarily on defense orders.

We also should not forget the consumer goods being produced at defense enterprises, whose production capacities can supply 20-25 percent of the overall output volume of nonfood consumer goods (over 8,000 descriptions). Today, this share is practically 100 percent in the production of radio receivers, televisions, video recorders, and sewing machines; 95 percent for refrigerators, freezers, and tape recorders; 75 percent for vacuum cleaners; 70 percent for motor blocks and calculators; 65 percent for washing machines; and approximately 50 percent for motorcycles.

In short, the existing system of defense sectors of industry is undoubtedly the most significant and best part of the country's scientific-technical, technological, and production potential, the most science-intensive sectors of the national economy, and, finally, our opportunity to have high-quality domestic consumer goods. Therefore, it is gratifying to realize that during such a difficult period for the country, the government of the Russian Federation has been able to look for opportunities and finally pay off producers for the products they have already delivered to the customer, that is, the state.

We believe that by preserving such a trend, the state of affairs with the development of the Armament Program for the Period up to the Year 2000 will also soon improve, which is directly dependent on resolving the problem of allocating funds for its implementation.

The minister of defense has planned specific measures to improve the financial support of organizational development and training of the Armed Forces of the Russian Federation in conditions of a reduction in defense appropriations. This obliges us, experts in the area of armament and military equipment, to be very responsible in the expenditure of the funds allocated for the defense order and to implement it strictly within the established volumes. However, the effectiveness of our efforts is directly dependent on the timely allocation and transfer of these funds to the Ministry of Defense.

I would like to believe that the government of the Russian Federation will continue to be understanding towards the needs of both the Russian defense sectors and the Ministry of Defense directorates placing the orders.

**Shulunov Proposes Replacing Command/Admin
with Horizontal Structures**

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PROTIVOVOZDUSHNOY OBORONY
in Russian No 1, 93 pp 11-13

[Interview with Aleksey Nikolayevich Shulunov, president, League of Defense Industry Enterprises, by ITAR-TASS military reviewer Andrey Naryshkin; place and date of interview not given: "Aleksey Shulunov: 'Russian Industry Is in Need of Radical Structural Reform'"]

[Text] Aleksey Shulunov, president of the League of Defense Industry Enterprises, proposes a new concept of the economy's structural reform to the Russian leadership. The league—a coordinating and negotiating center for around 700 enterprises of Russian defense industry—is engaging in an active dialogue with the government in regard to a wide spectrum of problems of economic reform. ITAR-TASS military reviewer Andrey Naryshkin met with A. Shulunov at the request of the editor's office. This interview is offered to the reader below.

[Naryshkin] Aleksey Nikolayevich, why in your opinion does the question of the structure of the industrial sector still remain open a year after the beginning of the Russian economic reform?

[Shulunov] Despite all attempts to reform the Russian economy, the infamous command system of administration still remains in Russia, albeit in veiled form. The vertical structures have essentially remained intact, while horizontal ones never were established. The reorganization of the administrative machinery proposed by the government foresees keeping the former vertical structure intact in the form of a kind of superministry and several committees—defense, machine building, light industry and so on. By doing so, it has maintained the status quo, while in the meantime we are unable to surmount the enormous structural imbalances in the economy throughout the entire period of the reform. Today, just like 10 years ago, around 75 percent of the national economic potential is concentrated in group A enterprises, producing the implements of production. Russian continues to be a "country of cannibals," ignoring the interests of its citizens and consumers.

Colossal investments and an enormous amount of organizational work are required if we wish to get away from the futureless economic model and redistribute resources between group A and B enterprises at a fifty-fifty ratio. But in the meantime the government, which has focused itself on attempts at reviving the financial system, is still not devoting adequate attention to this sphere of activity.

From my point of view, our economy can be led out of the "enchanted forest" only by subdividing the vertical administrative structure into huge horizontal structures,

by establishing large corporations or combined industrial-financial groups. Four or five hundred such associations would "dissect" complete production complexes out of our former ministries and create companies on this basis.

[Naryshkin] What do you see as the distinctive features and advantages of such production associations?

[Shulunov] Obviously corporations should be formed as structures of multiple profiles, including a production unit, banks and insurance companies. Today there are around 200,000 industrial enterprises in Russia today. Without violating the principles of the transition to a market economy, 40,000 enterprises could be integrated into the new corporations, while those that remain should be granted complete freedom of action, they should be allowed to merge or divide, and thus the elements of the new economic infrastructure would be created. However, it is the four or five hundred corporations that will determine all national scientific, technical and industrial policy. The corporations or industrial-financial groups may also be established on the territorial principle, on the basis of large industrial centers that have already evolved in Russia—Ural, Siberian, Far Eastern, North Caucasian, Volga, Moscow and others.

[Naryshkin] Does your model propose preserving some sort of coordinating center, a brain trust that would determine the priorities of economic policy?

[Shulunov] Of course. As I see it, there is a need for preserving the Ministry of Industry, while fundamentally altering its functions and reducing its administrative machinery. Developing the strategy of industry's survival and protection of state interests, including in the defense area, should become the main task of the reorganized bureaucracy. This naturally brings up the question as to where the sufficiently qualified specialists are to come from. From those same departments. We have essentially left managers at the highest level, capable of solving major national economic problems, with nothing to do. And at least 2,000 to 5,000 high-level executives are presently working in the former ministries. Not all of them prefer the old administrative system, and we can painlessly move two, three or five hundred highly skilled workers out of this environment and switch them to solving the problems of strategic planning, which is something that has to be done in a market economy as well.

This functional model, which balances vertical administrative structures against strong horizontal interlayers, has a number of advantages. It yields more easily to control on the part of the government, it provides a possibility for introducing and rigidly observing the principles of antimonopoly regulation and encouraging competition, and it essentially works in the interests of the market, rather than of state planning. It is only within the framework of this economic model that we will be able to, for example, compel giants of automotive industry such as Uralmash, ZIL, KamAZ and KrAZ to begin producing lighter motor vehicles, and VAZ to produce not only passenger cars but

also microbuses. As the experience of prior years shows, no other economic levers can make monopolists address the problems of the mass consumer.

[Naryshkin] In your opinion, what role should economic factors such as privatization and establishment of joint-stock companies play in restructuring?

[Shulunov] These things must necessarily be done, because we will get nowhere without first activating the principles of labor motivation. But when an enterprise is on the decline, it would be highly absurd to privatize it or turn it into a joint-stock company. On one hand this would mean deceiving the people, while on the other hand it would increase the risk of bankruptcy. Recall the lessons of recent history. In South Korea, most large diversified corporations were created in 1968, and it was 20 years later, after they could stand on their own two feet, that they were made into joint-stock companies. Talking recently with the president of Hyundai, South Korea's largest motor vehicle company, I asked him how he was able to deal with the colossal pressure from Japanese automotive business. The "secret" of success is extremely simple: Prior to 1991 the state maintained a rigid protectionist policy. The duty on imported motor vehicles was set at 300 percent, and few could allow themselves to purchase foreign brands. During this time the country managed to elevate its own motor vehicle industry, enter the international market and wrest solid positions for itself in the \$6,000 to \$12,000 motor vehicle market. South Korean motor vehicle builders are still uncompetitive in higher classes, but they have no doubts that a breakthrough in this direction is also but a matter of time.

Japanese, American and West German multiprofile corporations followed similar principles. But while Western industry developed by an evolutionary path, the eastern variant presupposes central leadership of the economy's restructuring with the active participation and support of the state.

Today the share of the state sector in most joint-stock companies of South Korea is around 35 percent. I think that this model of development is precisely the one that corresponds to the greatest degree with specific conditions of the Russian economy.

[Naryshkin] Russian First Deputy Minister of Defense Andrey Kokoshin, who is responsible in the military department for arms purchases and conversion, and his allies in the government and in the defense complex are actively promoting the idea of a national industrial policy. In particular they suggest that we single out several priority sectors of Russian industry as the "locomotives" that will lead the economy out of its dead end, and assist attainment of a breakthrough into foreign markets. Do you share these views?

[Shulunov] Completely, because without strategy, without a goal—I feel that a national industrial policy represents the strategic direction of industrial development—it is generally impossible to work today, to move forward. There are some things that are simply beyond

our means, and so in some directions in which we have fallen considerably behind, we will obviously have to borrow from foreign experience, and purchase technology, while in those sectors in which we are on the leading edge today, we should invest increasingly more assets and resources. The leading countries, which are interested in staying up with scientific and technical progress, spend up to 9 percent of their gross national income on research and development, on the development of science. In our country this indicator is almost three to four times lower.

[Naryshkin] It's no secret that Russia is yielding ground in international arms markets, losing to the West even in fields in which it was the leader a few years ago. How is this explained?

[Shulunov] I think that the dead end we have run ourselves into is the result of the system that had existed for many years in arms trade.

In the last 10-15 years we sold weapons, special equipment and gear worth a little over \$100 billion. Arms and equipment require guaranteed repair and routine maintenance, and the volume of deliveries of spare parts must be not less than 10-12 percent of the total value of the deal.

However, the existing system separated the arms producers from their foreign clients due to both philosophical and structural considerations. Spare part deliveries and routine maintenance occurred with a delay of 3-4 years. Thus we undermined our reputation and lost hopelessly to Western arms concerns that serviced their clients no worse than Rolls Royce or Honda. Things reached the point where firms have started appearing in the West which are trying to produce spare parts on the basis of our models and repair our military equipment. In the meantime we could be making up to \$3 billion per year just by delivering component parts for systems that had already been sold by the former USSR. In this case while arms are purchased on credit or by barter, as a rule spare parts are sold throughout the world only for cash. It is completely obvious that the entire arms trade system is in need of fundamental changes, with one of the main ones naturally being reorientation upon the interests of permanent clients and partners.

[Naryshkin] You often communicate with representatives of the supreme state leadership. What are you recommending to them, and what kind of things do you insist upon when you discuss problems of an economic nature?

[Shulunov] There is no need for serious changes in the course of government. Industry is undergoing a process of disintegration, and no matter what kind of rhetoric we try to hide under, be it left-wing or right-wing, it is simply impossible not to see this to be true. We can to some extent allow the disintegration and bankruptcy of 20, 30, or 40 percent of the enterprises, but when all spheres of production without exception are threatened by total stagnation, the risk becomes inordinately high. The processes of disintegration under way in industrial structures may become irreversible.

In my opinion the sole panacea for us today might be to impose stiffer state regulation over economic processes. What we propose to the state leadership today together

with Vladimir Ispravnikov, the head of the Supreme Economic Council under the Presidium of the Russian Supreme Soviet, conflicts with many postulates of privatization a la Chubays, and with certain legal and quasi-legal acts.

However, the time has come to admit that we are devoting criminally meager attention to the organizational part of economic reform, on the assumption that everything should fall into place by itself. That will not happen. Without competent administrative decisions, without expert management at all levels of leadership of economic structures, we will not achieve any kind of progress, we will ruin production, and we will place Russia on the brink of national bankruptcy. There is still time to come to our senses and adopt the right decisions, but with every day we waste, our chances diminish.

Clash Erupts Over Privatization of Petersburg Defense Plants

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in Russian 16 Jan 93 p 4

[Article by Natalya Nikiforova: "Dispute About Military Plant"]

[Text] St. Petersburg—On the very eve of New Year or, more precisely, 30 December, the St. Petersburg City Hall Committee for the Management of State Property received a message containing a resolution from the new Russian premier.

To be more specific: It was a copy of a letter from Viktor Glukhikh, chairman of the Government Committee for Defense Sectors, in which he informed Viktor Chernomyrdin that according to his information a number of military-industrial complex enterprises in St. Petersburg are being privatized without the government's permission. They include the Baltiyskiy plant, which is essentially the only one where large-tonnage surface warships are built. The flotation of that shipyard will drastically undermine the fatherland's defense capability. The premier addressed a resolution to Anatoliy Chubays, chairman of the State Committee for the Management of State Property: Investigate it, put a stop to it, and punish the culprits.

So this package of documents, as they say nowadays, was sent to St. Petersburg with the request that one of the prime suspects be sent to the capital immediately. (Of course no one went. Where was there to go to—it was New Year...)

It is true, is it not, that this hitherto unpublicized step by Viktor Chernomyrdin adds a unique nuance to the general picture of the first actions of the cabinet he heads.

There is hardly anyone who would believe that someone decided to privatize enterprises in the military-industrial complex in circumvention of the law and without government permission. Especially since everyone has heard

of the Russian President's well known edict No. 721 dated 1 July 1992, which finally opened the way to the flotation of the defense sector. According to that edict, if the State Committee for the Management of State Property does not object within two weeks to the list of enterprises proposed for flotation, you can boldly get down to business.

It goes without saying that the St. Petersburg Committee for the Management of State Property compiled a list and sent it to Moscow. It also goes without saying that our privatizers set to work in September after the prescribed deadline had lapsed.

In May I myself witnessed the Kirov plant workers' intention to "set Yeltsin and Gaydar straight" after the latter had promised to float the plant but had not kept their word. By spring last year it was clear to all, apparently, that this production unit, which was falling apart before people's eyes, saddled as it was with debts and unsold Kirovets tractors, could be saved only by deep structural transformations and a drastic change in the system of management.

It was precisely the same at the Baltiyskiy shipyard, which was in a most difficult position in connection with conversion: Two major orders had been removed from production and the main suppliers of materials and equipment were in Ukraine. No state took responsibility for the Baltiyskiy state yard. The yard itself was finding and continues to find ways to maintain a sufficiently skilled work force and ways to provide it with a normal standard of living. The yard took out credits and continued building—and is still building—an nuclear-powered cruiser which the defense department ordered but has not yet paid for...

Completely in accordance with the law the yard's workers adopted a decision 28 September on the flotation of the plant and on 18 December the St. Petersburg City Hall Registrations Office registered the new open-type joint-stock company. Apart from everything else, this enables the plant to escape the constant supervision of the defense sector. There is an escape route too. The Baltiyskiy yard really can produce competitive civilian output, clients know this, and so are waiting in line. Contracts have already been concluded with the German firm Arenkil [name as transliterated] for the construction of a series of 12 chemical tankers and with an Austrian firm for a series of Ro-Ro ships. Domestic orders are "on the horizon."

Who will lose out because of this? The Baltiyskiy yard workers? The rest of us? Or those people who are assuming the right to lay down the law and cream off someone else's rich pickings? It is the Baltiyskiy yard's workers who are the target now—they received angry letters from the capital even before the functionaries at the Committee for the Management of State Property. It would seem that now they have the right to say: Pardon us, but we are already a registered joint-stock company.

Nevertheless, Moscow demanded and is now carefully studying the Baltiyskiy yard's flotation documents.

All this is particularly amusing if you bear in mind that the plant began the work of conversion into a joint-stock company back in June. This fact was well known to the department of the shipbuilding industry, the industry and economics ministries, and consequently the committee for the defense sectors.

In that case what caused the New Year's eve reaction? The change of the head of the cabinet? Lobbying by someone from the industrialists' group in the government or the results of the still virtually unpublicized actions of the St. Petersburg privatizers, which had become obvious by the end of the year.

As the statistics show, St. Petersburg has long been ahead of the rest in terms of the pace of the destatization of large and small enterprises. In addition our team of privatizers has managed to do what no one else in Russia has done—the flotation of enterprises in the military-industrial complex is proceeding at full speed here. There are several hundred such enterprises in the city and the majority of them are now ready to be transformed into joint-stock companies. The documents of over 70 enterprises have been sent to the registration office and about 30 joint-stock companies have already been registered.

It is not just a question of the Baltiyskiy plant here, especially since under the privatization plan it retains its area of specialist activity. But if you add to that such plants as "Arsenal," "Pozitron," "Severnaya Verf," the Kirov plant, the Turbine Vane Plant... This is a powerful group in itself. For some people it would be a mechanism whereby Russian industry could be "hauled" out of the ossified defense system: After all, enterprises in the military-industrial complex have subcontractors all over the country and this will start a chain reaction of natural transformations. But for some people this is a noose which deprives the authorities of their own importance.

What motivates the people who are hindering the privatization of the military-industrial complex? Are they unaware of the statistics which St. Petersburg scientists have collected and analyzed? They studied the workload of our city's defense enterprises in terms of military orders. For example, according to the results for 1991 (the prereform year), they had on average 25-30 percent military orders. Only two production units were working more actively for the defense sector: the "Skorokhod" footwear production unit and a greatcoat factory. Of course, last year the situation did not improve. As for the future, here is a quote from the Baltiyskiy workers' letter to President Yeltsin, Prime Minister Chernomyrdin, Vice Premier Chubays, and Russian Defense Sectors Committee Chairman Glukhikh:

"...in the structure of the Baltiyskiy yard's production schedule the proportion of defense output in 1993 is 6 percent, in 1994 5 percent, and the last nuclear-powered navy cruiser is in the stocks right now (handover will be

in 1994). Military shipbuilding is missing from the long-term plans because of the absence of orders..."

So what about drastically undermining the country's defense capability?..

Incidentally, a few words about defense capability. By all accounts, the St. Petersburg City Hall Committee for the Management of State Property will have to go on the defensive. It may well be that it is in this very sector of the front line of privatization that the battle for the reforms is now being launched and on whose outcome a very great deal will depend. Not just for industry in St. Petersburg. As informed observers note, Viktor Chernomyrdin may change his position if people explain to him the true state of affairs with regard to the privatization of the defense sector in St. Petersburg. But at the very least they will have to achieve a breakthrough and meet with him. The directors of the military giants that are being floated and support the team of St. Petersburg privatizers headed by Committee for the Management of State Property chairman Sergey Belyayev are already trying to achieve a "breakthrough" by writing letters. Belyayev is described by his colleagues as a man who can "take the knocks." They note in this respect that it is hard to predict right now how hard those knocks will be. Much will depend on the stance of the State Committee for the Management of State Property and of Anatoliy Sobchak, who has promised Belyayev's team support.

Defense Industry, Russian-Ukrainian Common Interest

*93UM0380A Moscow KOMSOMOLSKAYA PRAVDA
in Russian 19 Jan 93 p 3*

[Article by I. Chernyak: "VPK [Military-Industrial Complex]: Reunification of Ukraine With Russia?"]

[Text]

The First Business—Aircraft

On 12 January at 12:00, a Russian TU-124 that was not listed in the schedule landed at Kiev's deserted Borispol Airport. Having become thoroughly chilled for nearly an hour in the cold wind near the broken down bus, its passengers were finally loaded into an Ikarus that had arrived to replace it and they drove off without attracting attention.

Russian Military-Industrial Complex Head Viktor Glukhikh and the entire VPK [Military-Industrial Complex] "elite"—nearly three dozen people—were the passengers. I already cannot recall when such a massive assault from this department landed on Ukrainian soil. The goal of the visit, according to official information, was the "signing of a package of documents on cooperation of Russian and Ukrainian defense complex enterprises".

According to unofficial information, the visit was caused by the extremely serious situation that has developed in

the defense industry of the two countries. "This has been caused by 'wholesale' conversion and also by a drastic reduction of the Goszakaz [State Order] for the production of arms and military equipment, and by the cessation of financing of a multitude of defense industry projects," one of the delegation's members told me. "And here there is the increasingly greater isolation of Russia and Ukraine and the breaking off of economic ties between their plants. And although Moscow's and Kiev's interests are interwoven, neither of them (by way of illustration, each of the nine former USSR military-industrial complex ministries had 15-20 enterprises in Ukraine), the politicians are not paying any attention to that. As a result—stoppages at dozens of shops and plants and hundreds of thousands of people without work or salaries, and billions in losses both for Russia and for Ukraine. The price of incompetence is enormous, although no one is assuming responsibility for this".

But they weren't searching for the guilty. They discussed something else for three days: how to survive further? How to adjust the relations that had existed between enterprises before the collapse of the Union? Approval of documents on that was conducted in a forest near Kiev, at Irpen Military Sanatorium. According to expert assessments, aviation industry representatives achieved the greatest mutual understanding. One of the main ones was the issue on the TU-334 passenger aircraft which was developed at Moscow ANTK imeni Tupolev and which should be produced at the Kiev and Taganrog aircraft plants. Both enterprises can annually produce up to 30-35 aircraft. In the words of experts, under normal financing, the aircraft will begin transporting and will yield huge profits in 1995. The TU-334 does not lag behind Boeing in comfort and its engines "consume" 2-2.5 times less kerosene than the TU-154. We hardly need to talk about how much it is needed today when the CIS air fleet is totally worn out and aircraft remain on the ground due to fuel problems. But, in the words of Kiev Aircraft Plant Chief Engineer Yuriy Rokka, financing of the work on the TU-334 is still being primarily conducted by Ukraine, Russia already owes R800 million and, if it continues this way, the enterprise will simply cease to operate.

"Besides the TU-334, we consider production of the IL-96-300, the T-204, the IL-114 and the AN-38 to be the priority directions," said Anatoliy Bratukhin, Glukhikh's deputy who manages the aircraft industry. "I will point out that this beginning had already been created in the former USSR and the development of the documentation on them began 7-8 years ago. But if the IL-96 recently received a flight worthiness certificate that permits us to begin series production, the first five aircraft will soon begin transport flights; if the TU-204 and the IL-114 receive their certificates this year and they begin to transport passengers in 1993-1994; and, if the AN-38 is also expected in 1994, the TU-334—last in this line—will have turned out to be a stepchild. After the collapse of the Union, neither sovereign Ukraine nor sovereign Russia have enough money for it..."

But it is impossible to overlook the aircraft—otherwise we will have to purchase this class of aircraft in the West in the future and we will be transformed into an importer instead of an exporter which will be many times more expensive. It is a question of billions of dollars. That is the reason why the conclusion of the agreement on joint development and series production of the TU-334 was noted with a champagne toast.

The military-industrial complex "generals" also visited Kiev Aircraft Production Association and the Antonov firm. They did not drop by out of courtesy: the old AN aircraft on which many of us have frequently flown are totally worn out and it is long since time to replace them. And there is a world-class replacement. By way of illustration, the AN-70 multipurpose transport has been prepared to replace the AN-12 and, if its financing had not been terminated in 1989, the aircraft would have already taken off. The money has finally been found—now the lack of several assemblies, delivery of which Russia is promising only in June, is delaying the initiation of the planned series production at Dnepropetrovsk and Samara plants. In the words of Antonov KB [design bureau] Chief Designer Petr Balabuyev, there is enormous interest in the AN-70 in the West. According to expert calculations, the world will require over 3,000 aircraft of this class because the struggle for supremacy in the market is going along all possible paths. From France alone, the minister of defense visited the plant and three more delegations arrived after him. "They kept coming until we asked them not to try to catch a glimpse of the new aircraft," says Balabuyev. The British Ministry of Defense sounded out the possibility of a partnership for work on the AN-70 and the Italians came to the plant where the aircraft engines are being produced for it. (By the way, should we be surprised by the attention toward the AN-70 if there are many people who also want to even purchase its predecessor, the AN-12? Only there is nothing to sell—the majority are really only suitable for the scrap heap).

Orders for the AN-38, that is being developed to replace the AN-2, have already arrived from Ukraine and India and China is proposing the establishment of joint work on the AN-180. The AN-3, that is being developed for the needs of agriculture, will also enjoy demand: with the collapse of the CMEA [Council for Mutual Economic Assistance], problems with light aircraft have arisen in the CIS. Therefore even the protocol on intentions for joint development and series production of all of these aircraft that was signed by the heads of Russia's and Ukraine's military-industrial complex can be considered a success. And there were also the agreements on cooperation in aircraft engine building, in the sphere of production and deliveries of aircraft equipment, joint production of the KA-128 multipurpose helicopter and the KA-31 transport combat helicopter...

From other documents, I will note the agreements on joint development and support of the operation of missile-spacecraft, during the work on which a common language was also found comparatively easily. Despite a

number of disputed issues, agreements were prepared on cooperation in the development and production of armored vehicles, electronic and radio equipment, communications systems, optical instrument making, and also munitions, special chemicals and industrial explosives. The latter is especially important for Ukraine, the primary scientific centers and enterprises for the production of all of these goods remained in Russia, and there are neither the needed materials nor the specialists at the only Ukrainian institute. Kiev already owes Moscow a half billion rubles for the purchase of explosive products, and the situation will hardly change in the near future: In the words of Yuriy Starodub, Glukhikh's deputy who manages munitions, Ukraine will only be able to independently stand on its own two feet in this direction in five years.

The "Russian Bear" Exhibits...

On 13 January, the entire package of agreements was signed by Viktor Glukhikh and by his colleague, the Ukrainian Minister of Machine Building, the Military-Industrial Complex and Conversion Viktor Antonov. After that, the military-industrial complex's special emissary flew to Moscow to transfer part of the agreements to Prime Ministers Chernomyrdin and Kuchma who are conducting negotiations there. Glukhikh traveled to Zaporozhye with Antonov, to Motor s/ch, the pearl of CIS aircraft engine building. The enterprise has no equals in the world based on the volume of production,—5,000 engines annually. The republic labor party was born here, one of the goals of which was to prevent a final split between Ukraine and Russia. It is not surprising: 90% of the components come here from Russia and 90% of the finished engines are returned to Russia. Sixteen aircraft construction plants, practically the entire CIS aircraft and helicopter fleet, are "linked" to Zaporozhye. But 40,000 Motor-s/ch workers are "tied" to their neighbors throughout the CIS.

"Today one country—be it Russia and Ukraine—cannot produce modern engines alone," said Plant General Director Vyacheslav Boguslayev. "Take the engines for the TU-334. Besides us, Ufa, Samara, and Moscow plants are participating in their development. If the Ufa Plant stops shipping us some sort of spark plugs, work will stop: there are no similar plants in Ukraine. The situation at the plants is extremely serious, add to that the fact that there are people both in Ukraine and in Russia who promote in every possible way the penetration of foreign equipment into our country. If we lose the struggle—hundreds of thousands of peoples will be left without work".

According to expert information, the quality of Zaporozhye engines has even increased despite the collapse of the economy, and the volume of their production for civil aviation has increased. But even here they stressed that the "delights" of the former USSR have been set into motion. Say, the D-27 new generation engine for the AN-70 and AN-180—this is the result of a specially developed Soviet national program which involved

dozens of institutes. Despite its small size, colossal energy is concentrated in the D-27, it has no equals in the world, because so far they are protecting it from foreign eyes and it has not been exhibited abroad. Today, at Zaporozhye they are already working on sixth generation engines and, in the words of specialists—"actual engines that are quite a bit more energy-intensive than the best of the existing engines".

"All of that proves that Motor-s/ch is a gold mine for Ukraine," said Viktor Antonov at a meeting with the plant's leadership. "I promise to take all of the required steps to get the money for you".

It will be difficult to carry out the minister's promise: by his own admission, military-industrial complex graduate, former Yuzhmash General Director Leonid Kuchma flatly refused to "feed" what were his own people yesterday. Many people explain this by the fact that the storm of attacks that was heaped upon his Colleague Viktor Chernomyrdin after the financial support of the native petroleum complex that had already been planned by Gaydar became a lesson for the Ukrainian premier. But this policy could result in the fact that we will have to terminate work on the "fantastic" engines. It's as if lagging behind is being planned—even in those areas where the USSR and later the CIS were "ahead of the entire planet". There are already precedents: say, active development of a high thrust engine has begun in the West and specialists in independent Russia and Ukraine who are a head above many of their colleagues "from abroad" just gnash their teeth: they won't give us the money. Do we need to prove that even here savings will turn into 100-fold losses?

At Zaporozhye, Viktor Glukhikh advocated the creation of Russian-Ukrainian SP [joint venture] defense enterprises: "In order to produce those same engines and to win trumps from your Red Guards, we need to create a powerful weave with both money and property". To ease the situation with reciprocal payments, he proposed the creation of the Russian-Ukrainian Military-Industrial Bank and Antonov supported him in that. We can also consider to be a sensation Glukhikh's assertion that in contrast to the former USSR that did not deliver the latest arms and military equipment to the world market, Russia will begin to do that. Despite powerful opposition of certain Western countries and military corporations who did not expect that from the "Russian bear", models of super-modern production have been prepared for shipment to the largest international arms exhibition-sale at Abu-Dhabi.

To Whom Is Our Proud Varyag Being Sold?

On the evening of that same day, the Russian Federation delegation flew to Nikolayev, to Black Sea Shipbuilding Plant. After that, as Ukraine took it and the remaining enterprises on its territory under its own jurisdiction, the Black Sea Fleet was left practically without a ship repair facility. Yes and this has added to Moscow's problems with the completion of combat ships, already not talking

about new ones. But even here it cuts both ways: if components and weaponry do not arrive from Russia, it will be extremely difficult for Ukraine to complete the ships. So, it is easy to guess about the content of the negotiations that are occurring behind closed doors.

The issue on the heavy aircraft-carrying cruiser Varyag, that was developed at one time to ensure parity between the United States and the USSR at sea, was raised separately. Glukhikh and Antonov even inspected the deck of this structure that is 19-stories high. (While they were being lifted up, the primary concern of those accompanying them was to not lag behind: there are 3,500 spaces on the cruiser, it would be difficult to find your way out of these catacombs by yourself). The fifth year ship stands at the wharf, 70% complete, its hull has begun to rust and its equipment has begun to be pilfered. If financing had not ceased, the cruiser would have been turned over in 1994 but work on it ceased in October 1991. It is impossible to understand what should be done with it now: in the words of ChSZ [Black Sea Shipbuilding Plant] General Director Yuriy Makarov, R70 billion will be required to complete construction, another 2,000 kilometers of cable alone is needed. Continuation of work will help hundreds of plants to survive but no CIS country by itself will sustain Varyag. At the same time, if not the same sum then a comparable sum will be needed if the cruiser is scrapped. (The unfinished TAKR [heavy aircraft-carrying cruiser] Ulyanovsk was recently cut up for scrap at Black Sea Shipbuilding Plant—the physical work alone cost R340 million. According to expert calculations, Varyag will cost R10 billion). Sell it abroad? But who needs an unfinished ship and, if they do need it, at a "semifinished" price, essentially, for next to nothing. In general, they have agreed to make a final decision in the first quarter of 1993.

At Nikolayev, Glukhikh, Antonov, and Russian Federation Goskomimushchestva [State Committee for Property] Chairman Vladimir Mashits drove out to see the head of the local administration at the former Party obkom building. There are now two armed guards in the former first secretary's reception area. In an enormous office is a color portrait of President Kravchuk, under which the new oblast boss sits. We didn't manage to learn about his labor path: everyone we asked shrugged their shoulders—he sat somewhere in an administration until he rushed into politics. One line speaks about the assessment by him of his own importance: when the three ministers and two representatives of the Ukrainian Armed Forces commander went in to see him, he carelessly said something like: "Well, report what have you got there".

How many like him in Russia and Ukraine have unexpectedly-blissfully found themselves in power, in the highest state organs, without having either the economic knowledge or experience for that... With their blessing in April 1992, when Viktor Antonov signed several documents on cooperation between his own defense enterprises with Russia, an entire campaign—"enemy of the Ukrainian people" was begun against him—that was not

the sharpest thing that he had to listen to. But common sense returns, though slowly. Today, in Antonov's words, even the most radically minded deputies, including from Rukh, have approved closer ties of the two countries' military-industrial complexes.

Its just too bad that this understanding has cost both the economy and the people so much.

Russia Pursues Conversion on Different Fronts

Russia Plans Conversion-93 Exhibit at March Exhibition in England

93UM0391A Moscow KRASNAYA ZVEZDA
in Russian 27 Jan 93 p 1

[Article by KRASNAYA ZVEZDA correspondent Valentin Rudenko: "Russian Conversion-93 Exhibition in Birmingham"]

[Text] In light of the great amount of interest on the part of Western industrialists and businessmen in the realignment process our defense enterprises are undertaking with a view toward the manufacture of civilian products, the Russian Federation government has decided to hold the specialized exhibition Conversion-93 in March of this year in the city of Birmingham (Great Britain).

We have been informed by Aleksandr Korzh, deputy chairman of the Roskomoboronprom Main Administration and a member of the exhibition organizing committee, that a desire to participate has been expressed by more than 100 enterprises, scientific research institutions, and design bureaus of the Russian defense complex, and of a number of CIS member countries. They will feature there the latest technologies, in addition to displaying products manufactured under the conversion arrangement.

Russia Aircraft Conversion Projects, India Deal Described

93UM0391B Moscow KRASNAYA ZVEZDA
in Russian 30 Jan 93 p 2

[Article by Stanislav Smirnov: "'Duet' Nearing Take-Off"]

[Text] The OKB [Special Design Bureau] imeni V. M. Myasishchev, having survived a time of uncontrolled conversion, is finding ways to do constructive work under the new conditions.

This was the place that as early as the 1950s created the 3M strategic bomber, which was referred to by NATO as the "Bison" and became subject to the provisions of SALT-II. Incidentally, this craft is still in use, serving as a tanker. In the 1980s, the firm developed the VM-T Atlant, which carried the Energiya-Buran rocket system to Baykonur. Later came the Stratosfera high-altitude subsonic aircraft designed for ozone layer research.

The OKB started in 1992 to work in close cooperation with the National Aviation Laboratory of India on the development of the light passenger aircraft Duet for carrying 14 people. It will be used under conditions of high-mountain areas. A. Bruk, the firm's chief designer, is heading the work on the Russian side, while Doctor Narayan is his Indian counterpart. The designers intend to power the aircraft with two pusher-type propeller engines [dviagtel'i s tolkayushchimi vintami] to be located at the tail section. The commercial range at a speed of 550 km/h is expected to be 2,000 km. The length of take-off and landing roll is 600 meters. This will assure the aircraft a competitive position in the capacious market not only in India and areas of Southeast Asia, but in Russia and Central Asian CIS countries as well.

Specialists of the National Aviation Laboratory, situated in Bangalore, have been working on the project for three years; the design they are proposing is the fifth one so far. The Myasishchev OKB was working on a similar project; the two collectives have combined their labors to create a single aircraft. (You can see a model in the photo. This is the first time a picture has been published.)

In addition to the Duet, conversion efforts under way at the OKB imeni V. M. Myasishchev involve completing the development of design documentation for the Gzhel, a 7-passenger business class aircraft. The craft is slated for series production at the Nizhegorodskiy Sokol Aviation Plant. On the drawing boards at the firm are the Yamal light multi-purpose amphibious aircraft; the Air Ferry high-tonnage container aircraft; a 50-passenger aircraft for use by local airlines; and the Ekologiya dirigible.

Valeriy Novikov, OKB chief executive designer, believes that work on these projects will enable the firm to maintain its position of high scientific and technical potential and prestige.

'Energiya' Decree May Indicate Willingness To Denationalize

93UM0427A Moscow KOMMERSANT-DAILY
in Russian 4 Feb 93 p 1

[Article by Aleksandr Romanov: "Privatization Has Reached Cosmic Heights"]

[Text] Yesterday, "X" reported on the coordination of a privatization plan of the Sukhoy Experimental Design Bureau Aviation Scientific and Technical Complex, and received in the mail that same day was Governmental Decree No 1045 on Creation of the Russian Space Holding Company, the "Energiya" Scientific Production Association imeni Academician S.P. Korolev, authorizing this world-renowned Russian rocket and space firm to become a joint stock company.

Observers regard making a joint stock company out of "Energiya"—an enterprise associated with the elite of the military industrial complex and, accordingly, originally at

the top of the lists of those prohibited from being privatized—as a willingness to eliminate the taboo on denationalization of the most important defense enterprises.

The Energiya Scientific Production Association [NPO] is the leader of Russian rocket and space machine building and the creator of numerous military systems, spacecraft, orbital stations, and the powerful carrier rocket Energiya.

The desire to get out from under state trusteeship and be given greater independence, for example, in questions of attracting investments, and also to take advantage of the privileges granted under a joint stock form of ownership made the leadership of the Energiya NPO turn to the State for the Management of State Property and then to the government with a request to exclude the association from the list of enterprises prohibited from being privatized. Since November, this question was discussed at various levels of power and finally was resolved in the association's favor.

The governmental decree, coordinated with the Supreme Soviet Committee on Economic Reform and Property and the Commission on Transportation, Communications, Information Science, and Space, justifies the decision on making "Energiya" a joint stock company by the need "to ensure creation and operation of complicated space complexes...in conditions of the sharp decrease in state orders in the total volume of production."

The decree calls for organizing a new joint stock company in the form of a holding company, which will include a head design bureau (Kaliningrad), an experimental machine building plant (Kaliningrad), and the Volga and Primorsk branches (Samara and the city of Primorsk of Leningrad Oblast). According to preliminary calculations, the authorized capital of the future holding company will be about 1 billion rubles.

A fundamental aspect which will have to be taken into account when developing a privatization plan is reserving a controlling block of stock of the head company of the future holding company for state ownership for three years. The requirement to reserve the controlling block of stock for state ownership will probably force the association to revise the draft privatization plan they have already developed. According to the draft plan, 26 percent of the voting shares being transferred to a trust administration, including the Russian Space Agency, is to remain state property (of the Russian Property Fund). It proposes transferring to the parent company of the holding company a controlling block of stock in its subsidiary companies established as open joint stock companies. Experts of "X" believe that privatization of such a unique complex will require development of a special scheme.

Defense Conversion Requires More Regional Focus

934E0127A Moscow IZVESTIYA
in Russian 18 Feb 93 p 4

[Interview with Vitaliy Solovyev, Russian Federation people's deputy and first deputy chairman of the Udmurt Council of Ministers, by IZVESTIYA correspondent Vyacheslav Shchepotkin: "Moscow Cannot Cope With the Conversion Alone"]

[Text]

[Shchepotkin] Thanks to the wide access to information now, information which is not a part of true secrets, the real significance of our military-industrial complex has started to become apparent. Well, could many people have assumed that Udmurtia's industry, let us say, is not only powerful, but oriented toward military production to a significant extent?..

[Solovyev] Not to a significant extent, but an overwhelming extent. More than 80 percent of the republic's entire industrial production was being turned out by enterprises in the defense sectors quite recently. Did we need to maintain this proportion forever? Of course not. Conversion is essential. Only the question of questions is how to implement it.

[Shchepotkin] To the best of our knowledge, the republic has worked out an independent—regional—program for the conversion. What is this, an initiative from "below" or a directive from those "at the top?"

[Solovyev] Rather an initiative resulting from our misfortune. We have been waiting a long time for the statewide conversion program, a union program at that time, but it was only being discussed. We even decided that such a program was a myth. But life has become more difficult with each day. Beginning in 1988, the volume of military production at enterprises in the republic began to be cut back, and in 1992 industrial production declined to its lowest level. Production for civilian purposes increased, but it could not make up for the rapid recession in defense output. And how was this to be done if the annual conversion level should be 3 to 5 percent according to world standards, but here it had risen to 30 to 40 percent, and even higher for individual enterprises?

In this situation, we adopted the first republic conversion program in 1991. We have been oriented principally toward centralized sources of financing.

[Shchepotkin] Excuse me, but why is this your own program if it must be implemented through the state budget?

[Solovyev] The conversion is such an expensive undertaking that local budgets cannot withstand the tremendous financial burden, no matter how hard the advocates of decisive action try to cope with it. It is another matter that the regions' capabilities must be utilized to the

maximum extent. First of all, by opening the way for self-financing of the conversion. And this should be resolved both by local and federal authorities, especially the latter, which for decades have become accustomed to taking everything away from the regions and issuing what they consider necessary for local needs afterward. This is the way they trained local authorities to count on the state budget, not on their own capabilities.

The second republic program, adopted in conformity with the Russian president's edict of 31 March 1992 "On measures to implement the conversion in the Udmurt Republic," opens the way to this self-financing. The sources may vary in different regions. For us, this means selling part of the oil we extract and the weapons produced by our enterprises.

[Shchepotkin] But doesn't the civilian production turned out by the defense plants provide funds for the conversion?

[Solovyev] It does. The republic has very recently begun to turn out microwave ovens, multipurpose kitchen appliances, home computers, disposable syringes, and place settings and decorations made of zirconium. This is in addition to what Udmurtia turned out before: motor vehicles, power tools, and much more. For example, about 16 billion rubles [R] and nearly \$170 million, in 1990 prices, were required in the 1992-1995 period for the enterprises being converted which are federally-owned and do not belong to us. This includes reequipment of production to turn out products for civilian use, personnel retraining, and support for the social environment. And destruction of the chemical weapon—the lewisite—stored in Kambarka? These operations alone require a total of R3.5 billion.

Can we obtain the funds needed? I am confident we can. The republic produces 9.5 million metric tons of petroleum each year. Only one-quarter is transferred for our disposal and it will not bring much for the conversion fund. But the largest receipts may be from exporting weapons. I have cited the requirement of the enterprises being converted in foreign currency: about \$170 million. So the export of arms and military equipment authorized for sale, according to specialists' estimates, will provide \$1 billion. Even if 70 percent is left for the republic, as determined by the president's edict, and the remainder goes into the federal budget, you can see the profit involved.

[Shchepotkin] Well, sell your product if they will buy it. Even though it has become possible to speak about this now, and to sell military products like any others.

[Solovyev] We can speak about it. We still cannot sell everything. I agree with the many arguments made by the president's adviser on conversion matters, M. Maley, when he spoke about the need to drastically change the organization of arms exports, reported recently in IZVESTIYA ("Arms Exports: Good or Evil?", IZVESTIYA No. 17). It is really ridiculous to have just four state companies to export military products and

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hope that they cover the entire VPK [military-industrial complex]. Making one's way to a foreign buyer through them is just like passing a camel through the eye of a needle. We know this from our own experience. Recently we knocked persistently on the door of one such department—"Oboroneksport"—and even went to its manager, General S. Karaoglanov. They told us that our product is not in demand in the world market.

[Shchepotkin] But perhaps that is the case? After all, they should be experts there.

[Solovyev] What are you saying! What do they take our specialists for? Don't the designers of weapons and plant directors know what is taking place in the world market and what their competitors are working on? Many ridiculous secrets have now been taken away, and it has become apparent how far domestic specialists have broken through in a number of weapons areas—beginning with small arms, where one would think it is hard to devise anything new, and ending with independently-targeted artillery shells, antimissile systems, and so forth. We are turning out quite a few competitive products. The famous Kalashnikov assault rifle, sniper rifles, the Makarov pistol, and other weapons. The federal government recently authorized a number of additional items, including an air-to-air missile, an antitank guided missile, an antiaircraft missile system, a tactical missile system, and a guided high-explosive fragmentation round [oskolochno-fugasnyy upravlyayemyy vystrel]—the one about which they say: once it is fired, it is forgotten. It is forgotten because it hits the target right away.

We know that there are buyers for all this, including the Kalashnikov assault rifle, the production of which has even been organized in other countries and which is being sold successfully in the world market, although the Moscow export firms state that no one needs them. And for that reason, I think, the concept of regional companies with joint capital which are closer to the manufacturing plant and the region's problems is correct. But what we in the republic cannot agree with is that the manufacturing plant cannot go directly into the world market.

Indeed, some of the domestic arms producers may be locked into regional trading firms, inasmuch as weapons are far from being the main product of such an enterprise and it will cost more to set up its own marketing service. But after all, there are quite a few such enterprises in Russia which have many years of experience in foreign economic activity, an adjusted marketing system and high-class specialists. Let them compete with each other. Within the framework of the law and under the supervision of federal organs, but for the good of the region and Russia as a whole. The Udmurt foreign economic company "Kalashnikov" A/O [Joint-Stock Company] was formed not long ago, for example. However, the well-known "Baykal" firm has been exporting arms for a long time. Even if it is not the entire assortment—mainly hunting weapons, but it has held a position in the world market. Why reduce the number of sellers in order to expand the trading area? And it turned out that "Baykal"

has left the market and "Kalashnikov" will not enter it. Last November, the Russian Government decreed that the new company would be issued a general license to export arms, but it does not have it yet. But time is passing, and what could have been purchased from Russian sellers is being obtained from our competitors, and we do not know who is pocketing the foreign exchange instead of the domestic budget. Despite the Russian president's edict, the conversion is slipping in the region. This is reflected in the economy of the country as a whole. After all, as the call is made in the regions, so it is echoed in the federation...

'Closed Cities' Hold First Conversion Fair

MK2502115093 Moscow MOSKOVSKIYE NOVOSTI
in Russian No 9, 28 Feb 93 p B8

[Unattributed report: "Secret Cities Will Tell Almost Everything About Themselves"]

[Text] Penza-19, Zlatoust-36, Sverdlovsk-44, Chelyabinsk-65, Tomsk-7, and other closed cities (there are approximately 80 of them in Russia) constitute a unique system of settlements containing high technology, a strong intellectual potential, and highly qualified personnel. For many years the most advanced types of military hardware were developed and produced there, and today, when across-the-board conversion has placed many of these cities on the verge of bare survival, they are inviting business people to use their outstanding production capacities to produce civilian goods that will be competitive on the world market. The aim of Russia's first fair of formerly top secret facilities is to help these closed territories find a market niche, identify leading-edge business activities, find customers to use their conversion facilities, and restore their ruptured production links.

The Sibkonversiya-93 fair will give the secret cities the opportunity to display their world class scientific and technical products and unique technologies, and to demonstrate their abilities to manufacture sophisticated household goods and products that normally have to be imported.

Sibkonversiya-93 is organized by the firm Sibirskaya Yarmarka.

Head of Khabarovsk Kray Administration on Prospects for Development

934E0285A Moscow DELOVOY MIR in Russian
11 Mar 93 p 3

[Interview with Viktor Ishayev, head of Khabarovsk Kray administration, by DELOVOY MIR correspondent; place and date not given: "We Oppose the Clearance Sale of Resources"]

[Text]

[DELOVOY MIR] Viktor Ivanovich, what, in your view, is the characteristic feature, of this kray?

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[Ishayev] Historically, our kray has been Russia's defense industry and raw material region in the Far East. Of late it has extensively developed as a transportation area. These are the three parameters that have become determining in terms of our economy and economic development.

As to the raw-material potential, it is quite high. The territory is huge. It is true that no more than 28 percent of its subsoil has been explored. However, even the known deposits are sufficient for the extraction of gold, tin, and many others. We have found natural gas in the Ural area and are actively looking for petroleum.

Two most important main railroad lines cross the territory: the Trans-Siberian with terminals at Vladivostok, Nakhodka, and Vostochnyy, and the BAM [Baykal-Amur Main Line] with terminals at the Vanino and Sovetskaya Gavan Ports. Following the breakdown of the Union, Russia lost a number of maritime ports. For that reason, today thousands of freight cars are waiting at our ports which are unable to cope with this flood. Freight is arriving not only from Russia but also from Kazakhstan, Belarus, and other former Union republics. Add to this runs in the opposite direction. Kazakhstan for example, ships its grain through our ports and it is through those same ports that goes the flow of grain is shipped back to Russia. Therefore, our sector of the Trans-Siberian and the sea ports in the southern part of Maritime Kray have reached capacity. Substantial funds are needed to expand their handling capacity.

However, there is an interesting alternate plan. Currently the BAM is not overloaded. This main line has a direct terminal at the Vanino maritime commercial port that is under development. This promises great opportunities.

Khabarovsk is the air gate to the Far East. The local airport is among the biggest in Russia. The landing and take-off strips and ground equipment can handle all types of aircraft. From here there are flights to the United States, Japan, China, and North and South Korea. The opening of new international routes is planned. We are hoping this year substantially to improve the standard of airport passenger services: to complete an international terminal which could handle 400 passengers per hour with the required set of services, and build a hotel and a business center.

The kray has acquired a powerful defense industry potential. However, this also is our most painful problem.

At one point in the past we had estimated that nearly one-half of the kray's population is employed by the defense complex or by sectors servicing it. Today this area finds itself in a most difficult position. We have entire plant cities, such as Elban. Amursk is in a critical situation. Not to speak of major plants in Komsomolsk-na-Amure and Khabarovsk.

[DELOVOY MIR] What is your view of the conversion issue?

[Ishayev] We have enterprises it would be simpler to raze to the ground and build new ones. This would be simpler and less expensive. Believe me, I have first-hand information on this problem. If we were to restructure an enterprise, its output should be as closely related to the previous one as possible. For example, if an enterprise produced navy ships it should try to make civilian ships, although in that case as well the difference would be substantial. Consider, for example, the plant imeni Gagarin. It builds most modern military aircraft. It may seem that converting to the production of civilian aircraft would not be all that complicated. However, the size alone of a modern passenger aircraft is much bigger. It would not fit in a shop between the support columns. This means that the plant has no choice. It could only manufacture a small sports airplane, such as the An-2, demand for which would not be great.

It is an advantage that all defense enterprises had shops manufacturing consumer goods. By increasing such output today it is possible to reduce military items, although this too is no simple matter.

It is an embellishment of the situation to claim that the process of conversion taking place in the country is chaotic. I have repeatedly tried to discuss this problem with representatives of Russia's government and with the military. What is necessary, above all, is to formulate a military doctrine. Then we must determine the extent of the conversion and the type of goods to be produced. It is not up to the head of a kray or oblast administration to decide whether to build nuclear submarines or not to build them, or else to build military or civilian aircraft. I believe that defense, transportation, communications, and the power industry should remain the prerogative of the state. A local conversion program is, in my view, child's prattle. In this case it is important to combine efforts and resources.

[DELOVOY MIR] How does the breakdown of economic relations affect the regional economy?

[Ishayev] Without such relations the Far East can simply not survive. Here is a simple example: In Kazakhstan I talked to the Republic's prime minister. In the final account, the issue came down to the following: If you stop supplying us thus and such, we shall not be shipping you thus and such. In our country everything is so interconnected that the breakup of such relations either by edict or personal decision becomes unrealistic.

We selected 27 territories, drew up balances, and signed agreements on cooperation. To us this is our daily bread. Consider, for instance, the power industry. Annually, we consume 7.5 million tonnes of coal. Yet our own coal production averages 200,000-300,000 tonnes. A number of food items are shipped to the kray. We are doing everything possible to restore interrupted relations.

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[DELOVOY MIR] What prospects do you see in agriculture?

[Ishayev] The situation here is very difficult. We have little arable land, no more than 0.06 hectares per capita. The only solution is the more efficient use of the land. Yes, the state sector does not justify its existence. However, if we were today to restructure this entire sector into private farms with one strike of the pen would be equally unrealistic. Everything must follow a natural development. We are trying to distribute land to the farmers and develop collective truck gardens. It is thus that one-half of the land has already been given to the people. The efficiency with which the farmland is used in the private sector is substantially higher. Thus, whereas the kray consumes today 400,000 metric tons of potatoes annually, 250,000 of that amount has been grown by private farmers although the area under that crop they have planted is several hundred percent smaller compared to the state sector.

We would like to free the sovkhoses from cultivating vegetables by increasing the number of private plots on which they are successfully grown. It would be better for the sovkhoses to deal more extensively with grain crops. They are quite good at that. Possibly, in the course of time we shall be able to produce mixed fodder domestically. This will make meat and milk prices more accessible.

[DELOVOY MIR] What is the policy of the kray administration relative to foreign economic activities?

[Ishayev] We are actively cooperating with more than 30 countries. They include not only our traditional partners in the Asian-Pacific area but also Australia, Switzerland, and Italy. In terms of trade, the first three are China, Japan, and the United States. More than 40 companies have opened offices in our area. China has opened a consulate general and the decision has been made to open a Japanese consulate general. All of this indicates that foreign partners are showing a great deal of interest in us. They are mainly interested in us as a natural storeroom. Our finished products are essentially noncompetitive. However, even the marketing of our natural resources is unprofitable for us. This is a shortsighted policy. Today we are relying on the joint extraction and extensive processing of raw materials. The Lidoga SP [Economic Enterprise] is an example. It procured Japanese equipment. Today there are virtually no Japanese remaining there. However, not only did the Russians not stop working but even went further. The enterprise no longer sells logs but produces timber for construction and even flooring. Its production level has changed and so have the prices of its output. We are trying to develop a similar approach in the case of maritime products and minerals.

Naturally, we are not against allowing our foreign partners to sell their goods on our territory. However, here as well there is a stipulation: We have made the following offer to the Japanese: let us produce your consumer goods in our military plants and sell the entire output locally. Today we are developing a number of such joint

projects. We are trying to keep the doors open on the regional level not only to Japanese businessmen but also to business people of all countries.

**KRASNAYA ZVEZDA to Devote One Page to
Conversion Matters, Ads**

*93UM0436C Moscow KRASNAYA ZVEZDA
in Russian 6 Mar 93 p 1*

[Unattributed report: "For You Defense Workers!"]

[Text] On page five you will see a new headline, "The Defense Complex." KRASNAYA ZVEZDA has covered the problems of defense enterprises and the creators of armaments and equipment of the fatherland before this, but now in response to many requests we are starting up a special weekly page devoted to the "defense sector."

And as we plan it, this will not be just a matter of reporting urgent problems. The main goal of the page is specific, practical assistance to the enterprises of the defense complex. On this page we intend to publish comprehensive, helpful information and the most important official documents associated with enterprises of the military industrial complex, to promote in every way the organization of ties between the defense workers themselves and their related industries, to provide addresses for "direct contacts," to recount the experience of enterprises which are most successful in joining market relations, to describe the progress of conversion etc. We intend to devote an important place on this page, as on the others, to advertisements of defense products and conversion goods, which incidentally are published in KRASNAYA ZVEZDA at a discount of up to 60 percent of the usual cost.

We hope that the new page of KRASNAYA ZVEZDA will also attract the attention of business people, merchants, and entrepreneurs, including abroad, who would like to establish ties with Russian defense workers.

The defense department of Russia does not have its own mass print organ. In allowing for this lack and introducing the weekly pages of "The Defense Complex," KRASNAYA ZVEZDA is essentially announcing its readiness to perform such functions to the best of its ability.

Low Wages in Defense Industrial Jobs

*93UM0457A Moscow KRASNAYA ZVEZDA in Russian
13 Mar 93 p 5*

[Interview with Russian Federation Ministry of the Economy Defense Complex Economy and Conversion Department Head Vladimir Salo by an unidentified KRASNAYA ZVEZDA Correspondent: "Why the Wages Are Low"]

[Text] It seems as if we have begun to become accustomed to the paradoxicalness of the current situation with defense complex enterprise workers and employees wages. And therefore today few people are surprised that

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a highly skilled defense industry specialist receives less than his colleague from the "civilian" shop. Nevertheless, the acuteness of the problem is not being reduced. The figures that characterize it are depressing as before.

This is quite evident from the table which we requested Russian Federation Ministry of the Economy Defense Complex Economy and Conversion Department Head Vladimir Salo to comment on.

1992 Average Wages By Industrial Sectors

	Fuel-energy	Energy	Gas	Coal	Metal-lurgy	Light	Food	Machine Building	the Defense Complex	Industry as a Whole
1st quarter	5,666	4,768	9,544	7,570	4,541	2,405	2,312	1,827	1,775	2,612
1st six months	7,155	5,799	11,526	8,608	6,263	3,215	3,505	2,659	2,290	3,680
July	12,226	11,487	16,758	11,980	10,778	4,483	6,742	4,584	3,942	6,305
August	13,319	12,456	17,465	12,933	11,117	4,474	7,485	4,913	4,232	6,736
September	17,148	15,178	22,881	17,913	12,373	5,821	9,575	5,885	5,029	8,140
October	24,330		29,025	24,543		7,713	12,094	7,538	6,468	10,371
November	26,646	24,769	35,133	27,275	18,666	9,318	14,296	9,276	7,884	12,536
December	40,870	35,479		39,350	27,581	13,375	21,702	12,975	11,452	18,372

[KRASNAYA ZVEZDA] Why are wage rates so low in the defense complex?

[Salo] First of all because appropriations for the purchase of military equipment and weaponry have been drastically reduced. By 68%. Wage amounts are put into the price of the item. The second reason: the restriction of the level of profitability of a defense product that cannot exceed 25%. The reasons are in the budget, proceeding from which the order is determined, that is, the number of items that need to be produced, the prices for them, and also the customers' resources for payment of the order. But the Supreme Soviet that is approving the budget naturally could not envision the government's decisions on freeing prices. As a result, our parent plant enterprise-subcontractor's raw materials and materials have begun to be purchased at high prices and the cost of their deliveries has increased dramatically. And when component prices increase—the production cost increases. The profit (the difference between the price and the production cost) is reduced. Consequently, the capabilities of enterprises to increase wages for their workers is reduced. Because they are authorized to cull wages which can exceed the so-called "hard" wages only at the expense of the profits that are left at the plant's disposal.

Enterprises that are involved in the civilian sector don't have problems with profitability. They can increase it and increase prices up to 50% or 70%. Their purchaser is not a budgeter whose allocation of each ruble has been determined beforehand by the state.

The conclusion: there is no order and the defense industry is unprofitable because wages cannot move beyond the limits of the lower level—the four minimum wages (it was 900 rubles until January 1993. Today it is R2,250) guaranteed by the state.

Average Monthly Wages in Industrial Sectors in 1991-1992

	1991	1992
Fuel-energy	939	15,017
Energy	916	13,259
Gas	1,193	23,291
Coal	1,000	18,092
Metallurgy	758	11,284
Light Industry	629	5,252
Food Industry	645	7,832
Industry	593	7,022
Machine Building	513	5,033
the Defense Complex	507	4,343

(In the Defense Complex—while considering the state subsidy. Without the subsidy—R3,873)

[KRASNAYA ZVEZDA] What is being undertaken in order to retain people and to reduce the outflow of cadres?

[Salo] As we all know, the government has allocated a subsidy in the amount of R241.9 billion (this is a question of "pure" money, without social security taxes) which practically entirely went into the enterprise consumption fund, that is, to wages and to maintenance of the social infrastructure.

A decision was made on a coefficient of 1.3 that increases the amount of a defense complex worker's minimum wage. Thus, the old standard has been restored when defense workers high skills were paid 30% higher. Thanks to the coefficient, not four but five minimum wages will actually not be taxed at defense enterprises.

In these days, work is being completed on the allocation of additional payments to the social infrastructure of enterprises and also to workers and employees who are being released from the defense sector of production in 1993. They will be paid a minimum wage over the course of a year while they are being retrained.

Today we are aggressively working on how to make a just decision as soon as possible on indexing the amounts allocated for the order. Using the index, it will become possible to actually guarantee a 25% profitability of production. And this, in turn, will avoid the need to eliminate the shortage of resources at the expense of the consumption fund. The Supreme Soviet has already approved these proposals in the first reading.

The prospects will be favorable only in the event that the defense complex receives a specific task: how much and what kind of military equipment and weaponry it must build during the course of at least the next five years...

Food Processing, Farm Machinery Pushed as Conversion Firm Priority

93UM0476A Moscow ROSSIYSKAYA GAZETA
in Russian 24 Mar 93 p 4

[Article by Aleksandr Gavriluk: "It Proved To Be Unprofitable To Turn Swords into Plowshares"]

[Text] On 17 March, two top state officials—the vice president and the prime minister—arrived at the "Equipment for the Processing Sectors of the Agroindustrial Complex and Miniature Equipment" exhibit. A. Rutskoy and V. Chernomyrdin spent half the day inspecting miniature sausage-making shops, dough-dividing machines, refrigerating equipment, packaging equipment, motor units, mini-tractors, a cheese production line—products from 250 plants, scientific production associations, and concerns that are part of the Committee for Defense Sectors of Industry and the Ministry of Atomic Energy and operating under the conversion program. The event is also unusual because the welfare of many thousands of people is linked to it.

It is generally known that the country's agriculture loses as much as 50 percent of the raised crop due to the lack of processing capacities. The situation is made even worse by the fact that only 9 of the 24 specialized scientific research institutes for processing in the former USSR are left in Russia. Moreover, 3310 of the 5500 enterprises of the food and processing industry require renovation and retooling.

When the functions of the Ministry of Food Machine Building, eliminated in 1988, were transferred to the defense industry, calling this conversion, many saw this as good, although a different point of view exists. The ministry produced equipment on which 18 million people worked in the former Soviet Union.

Nevertheless, all the defense ministries were clearly assigned a specialization, the plants were divided up, and the product mix established—a systematic approach was used. It must be said that the process of the adapting both the defense worker specialists and the production facilities in particular was fairly complex. Imagine people who had worked their entire life on creating nuclear bombs suddenly were processing milk. Some even had to be untrained for a year at a food institute in order, after missile technology, to gain an understanding about the processing product.

It is not surprising that, say, the potato processing systems shown at exhibitions bear a striking resemblance to missile fueling systems.

It took one and a half to two years to become familiar with the products of the best milk processing firms in the world. They worked with milk the same way they worked with uranium before. It turned out that it was not a bit easier to work with milk. The Ministry of Atomic Energy got 50 plants and 15 design bureaus involved in this problem. The state allocated money, financing was centralized, and the work proceeded.

"I say with confidence," Vladimir Karetnikov, president of the 'Karimos' Joint Stock Company and in the past Chief of a Main Administration of the Ministry of Atomic Energy, told me, "that if we had kept this configuration, the problem of technical re-equipment of the processing sectors of the agroindustrial complex would have been eliminated today."

Everything collapsed when macroeconomic ideas prevailed in the economy, and new, young people appeared in Russia's government. Conversion ceased to exist as a state program.

"They told us that now there will be no money; engage in conversion and try not to drown in the market sea. Is this really conversion? For a year and a half we have been making great efforts for the plants to continue to work with dairy equipment, on which years and huge amounts of money were spent to create," Karetnikov reflects.

They closed about 400 plants and 220 huge scientific research institutes and design bureaus capable of developing equipment at the highest level. Everything ran up against, above all, credit assistance, without which, sector managers believe, it is impossible to develop our own industry. And it is not a question of preferential credits, but also not at the interest rates existing today.

The collapse of conversion enterprises roughly coincided in time with the instruction to A. Rutskoy to study questions of agriculture, processing in particular.

"I receive full support from him, but the point is that my conversation with him increasingly convinces me that all the vice president's most fundamental proposals are being sabotaged in the government. They do not refuse

us in words; well done, they say. But here they have prepared a draft decree. Aleksandr Vladimirovich [Rutskoy] sent it to the government, G. Khizha sent it for a conclusion through the ministries, and it has been 'going' for two months now," says Vladimir Karetnikov.

Still, in late 1991, A. Rutskoy creates an agricultural processing corporation—"ROKAP," which included all conversion enterprises engaged in creating this equipment.

"The task is to provide assistance, above all, to farmers," the president of the corporation, Anatoliy Yershov, said to me. "A program for the basic directions was developed that was oriented on farmers. According to calculations of the corporation's specialists, they should produce up to 10 percent of the total volume of agricultural products. To do this it was necessary to organize 91,000 farms after the western model. And this included houses, outbuildings, and roads, which required 400 billion rubles."

It soon turned out that we did not have this kind of money. But what is more astonishing is that the AKKOR [expansion not given] showed no interests at all either in developing the program or in the corporation.

"The farmer association AKKOR is a political organization, and it is not completely clear to me if the money being allocated by the government for development of the farmer movement is being properly spent," believes A. Yershov.

Anatoliy Maksimovich [Yershov] is skeptical about adoption of a favorable conclusion for the conversion program developed under the vice president's supervision. There are some negative conclusions toward the draft decree. Like a bureaucratic incident, A. Yershov told me about a conclusion made by A. Chubays' department. The essence: Do we need to create equipment for processing agricultural products if the amount of these products is declining...

So, does our agriculture need equipment for processing? Judge for yourself. Here are reports just for last week: Irkutsk Oblast will spend \$50 million to purchase equipment for processing; in Novosibirsk an agreement has been signed on the creation of a joint venture for processing potatoes, where 54 percent of the authorized capital will belong to the Americans. The list could go on and on.

Maybe our equipment is more expensive and not as good?

"No," claims Vladimir Uglev, a specialist who has been studying equipment for processing for many years. "It is on roughly the same level as European equipment both in the specific amount of metal and energy used. It also is just as reliable as similar western equipment. Moreover, it is considerably less expensive."

Here is why they are so anxiously awaiting the arrival of A. Rutskoy and V. Chernomyrdin at the exhibit.

Rutskoy told me:

"Now, when the program counted down to the kopeck is ready, we will issue the government decree and begin series production of equipment for the processing industry. Moreover, I would like the equipment to be sold on installment payment or with leasing for 3.5 years. We also can trade in this equipment abroad, the quality enables us to do this; but we first must saturate our own market. How much can we buy abroad? This year we paid \$120 million just for dried milk, and here our plant for producing it costs 30 million rubles. The figures are incomparable."

Now we are doing the Pskov project. This is a full cycle: feed production, fattening hogs, and full processing and packaging. We will produce 60,000 tonnes of meat in just the one oblast. The equipment there will be Russian and Spanish, but ours will be 60 percent.

A conversation with Viktor Chernomyrdin instilled optimism. Viktor Stepanovich [Chernomyrdin] stated:

"Once we have a program, there will be special-purpose financing for it. The state must participate in implementing the program. I have been pleasantly surprised by all I have seen."

The question of setting aside exhibit areas for a permanent exhibit of conversion enterprises was decided right at the exhibit. It seems that a light has appeared at the end of the tunnel, and there is hope that conversion will actually solve the most painful problem in the agroindustrial complex.

April-December 93 Listing of Foreign, Russian Arms Expos

Foreign International Arms Expos Described

93UM0504A Moscow KRASNAYA ZVEZDA in Russian
3 Apr 93 p 4

[Article by Mikhail Pogorelyy, KRASNAYA ZVEZDA correspondent: "The Main International Military-Industrial Expos of 1993"]

[Text] The fact that Russia is able to compete in a fitting manner on the world weapons market does not need proof. One need only to recall Le Bourget, Farnborough, Abu Dhabi... It is another matter that trade in such a specific commodity (and not past deliveries to the countless ideological "brothers" for a symbolic payment) is an extremely delicate matter and something many defense suppliers are unaccustomed to. There is much to learn here. You see, no matter what is said about the moral side of the issue, the realities are such that we, like other major producers of arms and military equipment, have to export them. Certainly, this must be done in strict accordance with international norms and rules. This involves, we would note, not only maintaining the high prestige of the Russian "brand" of weapons, but also the enormous profitability of this business. In publishing summarized

and systematized information on the main international expos of military equipment and armament of 1993 in this issue of the "Defense Complex" page, we state our intention also to devote proper attention to this topic in the future.

There are 72 expos being held in the world this year which will exhibit armament, combat equipment, equipment, and military technologies. Experts regard this indicator as evidence of the good condition of the world market for defense products. Of course, the scale of each of the measures is different. In addition to those that are universally recognized and encompass dozens of countries and hundreds of participating firms, there are numerous narrowly specialized, regional, and even national ones with foreign guests invited. But a viewpoint is becoming increasingly firmly established that international expos devoted to defense aspects are becoming an important factor of openness and strengthening mutual understanding and trust between peoples.

Almost half of all expos are aerospace. They demonstrate not only new and future flying craft, but also equipment and technology for their production and servicing, equipment, and munitions. The most visible event of the year in this area, without a doubt, is the aerospace show at Le Bourget, a suburb of the French capital. The show is being held for the 40th time on 11-20 June. The organizers expect more than 2,000 participants from 35 countries.

The aerospace technology expo in Taipei has every chance to be marked by large contracts, furthermore not only in military aircraft building but also in the civilian sector of Taiwan's aviation industry. The government of this state plans to invest at least \$5 billion in development of this sector in the next two years and is counting on the active participation of foreign firms in this matter.

The Dubai-91 show conducted for the first time two years ago immediately acquired the status of the most important exhibit of aviation technology in the Middle East region. This is in no small part due to the presence not only of western firms but also the broad representation of developers and designers of the former Soviet Union. Dubai-93 will be held 7-11 November this year.

In the group of air shows, five or six measures specializing in equipment for helicopters stand out somewhat. It is interesting that three of them are conducted by Great Britain, clearly striving to strengthen its positions in helicopter building. However, the number is not

always the most important thing. Experts note that half of all aerospace expos, exhibits, shows, and the like are conducted in the United States, but this country has been unable to organize a North American equal to the universally recognized Le Bourget, Farnborough, or even ILA series in Germany that are confidently joining the "club of select" expos.

Judging by the number of measures being conducted, the interest of both industrialists, on the one hand, and the military, on the other, in the market for computer technology, communications equipment, and other advanced technologies, including so-called dual-purpose technologies, is considerable. These include "APLS-93 and "ENIGMA VARIATIONS-93" in Great Britain, ITEMS-93 in the United States, and a microwave equipment expo in Spain. For example, between 300 and 400 companies will be represented just at the latter.

A comparatively small number of expos, five to seven, devoted to naval equipment and armaments are planned. This is explained by the fact that some of the most significant ones are planned not in the "pure form." Great Britain, for example, plans to organize a "sea and land variant" of the famous Farnborough Air Show on 5-10 September. A new expo with a great scope has been thought up, but so far no one knows how it will actually look, since it will be held for the first time this year. Malaysia is organizing a maritime and aviation expo, "LIMA-93," for the second time and is counting on it to be more successful than it was two years ago.

The United States and Great Britain are conducting expos of the "COPEX" series, which will exhibit equipment for formations, not necessary troop formations, that are involved with questions of public security. The number of participants—50-60 countries in each—also indicates the interest in these problems.

Expos being conducted in our country also stand out in the series of international expos. There are to be three of them. Two of them, "Aerokonversiya-93" [Aerospace Conversion-93] and "Aerotekhnika" [Aerospace Equipment] will take place at Zhukovskiy, and "Aerospeys-93" [Aerospace-93] will be held at the Central Airfield in Moscow and at Kubinka. Foreign experts regard them as very promising and having good prospects. In addition, they see this as evidence of Russia's desire to enter the international market as a normal partner and an aspiration to encourage the commercial initiative of western companies, create joint ventures, and develop common projects.

DEFENSE INDUSTRY AND CONVERSION: GENERAL ISSUES

April-December 93 Foreign Expos Listed

93UM0504B Moscow KRASNAYA ZVEZDA in Russian 3 Apr 93 p 4

[Listing of foreign expos]

[Text]

Foreign Expos April-December 93			
Date and Place	Name	Basic Theme	Organizer, Sponsors
15-16 Apr, London, Great Britain	"Airmobility: Helicopter Gunships"	Role and tactics during peacetime and wartime, technologies, and projects	Joyce Zelinski. Sponsored by Ministry of Defense of Great Britain.
18-21 Apr, London, Great Britain	Security International	Support systems for information security, communications, and command and control.	ID Exhibitions
20-22 Apr, London, Great Britain	APLS-93	Organization of procurement and logistics in the armed forces	Applied Network Research, LTD
21-25 Apr, Norfolk, Virginia, USA	COMDEF-93	Expo, seminar, and air show, inspection of naval base and warships	IDEEA, Inc., National Association of the Defense Industry, U.S. DOD, Small Business Administration
27-30 Apr, Denver, Colorado, USA	Conference of the National Association of Transport Aviation and Fair	Production and servicing of air transport assets, associated goods	U.S. National Association of Transport Aviation
27 Apr-1 May, Ankara, Turkey	IDEM-93	International fair of defense industry products	IDEAL International Fair Organizations
28-30 Apr, Esher, Great Britain	Expo of subsystems, components, and spare parts for military equipment and hardware		Microwave Exhibitions
4-6 May, London, Great Britain	ITEC (International Training Equipment Conference and Exhibition)	Simulators and training equipment, particularly for civil aviation (in 1993)	ITEC, Ltd.
11-13 May, London, Great Britain	Enigma Variations-93	Communications, electronic warfare, and reconnaissance equipment	Osprey Exhibitions, Ltd.
25-26 May, Baltimore, Maryland, USA	COPEX USA-93	Equipment for law enforcement organizations and special-purpose formations of the armed forces. Technology for fighting drug traffic (in 1993)	Osprey Exhibitions, Ltd.
8-9 Jun, Paris, France	UV-93	European conference and exhibition of technological developments on the problem of unmanned air and space craft	Joyce Zelinski, Shepard Conferences; Sponsored by Great Britain's Ministry of Defense
8-10 June, Washington, D.C., USA	ITEMS-93 (47th Conference and Exhibition of the Association of Communications and Electronics of the Armed Forces)	Military communications, reconnaissance, and electronics equipment. Dual-purpose information technologies.	G. Spargo
11-20 Jun, Le Bourget, France	40th International Air and Aerospace Show	Air and space equipment	Salon General Commissariat
15-17 Jun, Cannes, France	Technology of Underwater Defense-90	European conference and exhibition of technologies, underwater equipment, and electronic systems	Microwave Exhibitions
16-19 Jun, Zhukovskiy, Russia	Aerokonversiya-93	Equipment and technologies of conversion of the aviation industry of the CIS countries	Glakhe International
21-24 Jun, Virginia Beach, Virginia, USA	Ninth Symposium/Exhibition on Security Technology	Advanced technologies of providing information security, arms control, and treaty compliance verification	American Defense Readiness Association
22-24 Jun, Orlando, Florida, USA	Symposium and exhibition of advanced technologies		American Defense Readiness Association
28-30 Jun, Fishermans Wharf, California, USA	29th Joint Conference and Exhibition of Propulsion Systems	Nuclear, electric, liquid- and solid-fuel engines for aerospace systems	American Institute of Aeronautics and Astronautics

DEFENSE INDUSTRY AND CONVERSION: GENERAL ISSUES

JPRS-UMA-93-015
11 May 1993

Foreign Expos April-December 93 (Continued)

Date and Place	Name	Basic Theme	Organizer, Sponsors
19-22 Jul, Oregon, USA	Specialized exhibition "Defense and Security" for western regions of the United States and Canada and the Asian-Pacific Region	Equipment and armament for intelligence, special-purpose, and police units	Midows Exhibition Group
3-5 Aug, El Paso, Texas, USA	Regional exhibition and conference on communications equipment and electronics	Electronic communications and command and control equipment	G. Spargo, Association of Communications and Electronics of the Armed Forces
4-8 Aug, Abbotsford, Canada	Airshow Canada-93	Aviation equipment	Airshow Canada. Sponsors—government of Canada and the province of British Columbia, U.S. Department of Commerce
16-21 Aug, Zhukovskiy, Russia	Aerotekhnika	Aerospace equipment and technologies, communications equipment, and simulators	Glakhe International
19-22 Aug, Taipei, Taiwan	Exhibition of aerospace technologies	Military and civilian aircraft building	Reed Exhibition. Sponsor—Taiwan's Ministry of Defense
24-26 Aug, Washington, D.C., USA	Modern Navy-93	Capitol Convention and Exhibit Company	
30 Aug-5 Sep, Moscow, Russia	Aerospace-93	Broad spectrum of products from the aerospace industry	"Khelbig Industry Messe." Sponsors—Ministry of Transportation and Ministry of Industry of Russia
2-3 Sep, London, Great Britain	Naval Aviation Helicopters		Joyce Zelinski, Shepard Conferences
5-10 Sep, Oldershot, Great Britain	Exhibition of equipment and armament of Great Britain's army and navy		Defence Export Services Organizations
6-9 Sep, Madrid, Spain	23d European Conference and Exhibition of Microwave Technology and Equipment	Microwave communications equipment for the armed forces and aerospace equipment	Microwave Exhibitions
14-19 Sep, Ankara, Turkey	IDEF-93	Armament of the Army, Air Force, and Navy, electronics, equipment for military medicine, civil aviation	Tyuyar Fairs and Exhibitions Organization. Sponsor—Armed Forces Fund of Turkey
14-16 Sep, London, Great Britain	MILCOMP-93	Computers and computer programs for the armed forces	Microwave Exhibitions
20-23 Sep, Huntsville, Alabama, USA	Conference and exhibition "Space Programs and Technologies"		American Institute of Aeronautics and Astronautics
22-26 Sep, Kamphong Son Air Base, Thailand	Thai Airshow-93	Military aviation, ground equipment, communications and air traffic control equipment	Conference and Exhibition Management Services. Sponsors—Ministry of Defense of Thailand and Royal Thai Air Force
28 Sep-1 Oct, Redhill Airfield, Great Britain	HELITECH-93	Helicopter building	Spearhead Exhibitions. Sponsors—Association of the Defence Industry of Great Britain, European Helicopter Association
October, U.S. East Coast	Symposium and exhibition "Target Drones and Remotely Piloted Vehicles"		American Defense Readiness Association
October, Quebec, Canada	International symposium on ballistics	Technologies of production of missiles and warheads, measurement equipment, simulators	American Defense Readiness Association
10-14 Oct, Washington, D.C., USA	30th Electronic Warfare Conference	Electronic warfare, communications, and command and control equipment, and electronics for the armed forces	AOC

Foreign Expos April-December 93 (Continued)

Date and Place	Name	Basic Theme	Organizer, Sponsors
24-28 Oct, Nashville, Tennessee, USA	International exhibition "Air Traffic Control"	Civil and military air traffic control equipment	Air Traffic Control Association
7-11 Nov, Dubai, UAE	Dubai-93 international airshow and fair	Military and civil aviation	Fairs and Exhibitions, Ltd.
9-11 Nov, Esher, Great Britain	COPEX UK-93	Equipment and armament for special-purpose troops and police	Osprey Exhibitions
7-12 Dec, Langkawi Island, Malaysia	LIMA-93	Aircraft and ships, engines, navigation systems, communications equipment, missiles, weapon systems	Le Proton LIMA. Sponsor—government of Malaysia

The editorial office has more detailed information on questions of participation in the expos. Telephone: 941-22-48. Fax: 941-40-57.

"Expocenter" Deputy Director on Exhibit Possibilities

93UM0504C Moscow KRASNAYA ZVEZDA
in Russian 10 Apr 93 p 5

[Interview with Vladimir Mikhaylovich Shkuratov, first deputy general director of the "Expocenter" Joint Stock Company, by Valeriy Baberdin: "Meeting Place—"Expocenter""]

[Text] In the last issue of the "Defense Complex" page, we talked about the upcoming international military-industrial expos in 1993. Many readers have asked us to continue talking about the possibility of participating in international shows which are conducted in our country and at which defense enterprises, scientific research institutes, and design bureaus could show their conversion products, find partners, and make the necessary contacts.

Today we are interviewing the first deputy general director of the "Expocenter" Joint Stock Company, Vladimir Mikhaylovich Shkuratov.

[Baberdin] The "Expocenter" Joint Stock Company was formed in 1959. Back then it was still a state organization engaged professionally in conducting international exhibitions in our country and supporting the participation of domestic enterprises in shows abroad. Having at its disposal the necessary specialists and a developed structure of display areas, it had a monopoly in the exhibition business of the Soviet Union. Even now, when few organizations like this have been formed, "Expocenter" rightfully occupies the leading position. How can it be useful for enterprises of the defense complex? It is with this question that we began our interview.

[Shkuratov] I must say that representatives of the defense complex were permanent participants and visitors at our exhibitions. It is another matter that we did not advertise this, and sometimes did not even know it. Representatives of the ministries conducted negotiations with foreign partners; they arranged the purchase of the

exhibits on display. The enterprises and design bureaus directly concerned remained in the background.

Now any "defense" firm can turn to us with a request to participate in any exhibition, symposium, or fair. And it can choose for itself the location for placement of the display.

The only condition is that everything has to be done in advance. Consider that we spend one to one and a half years on organizing a serious exhibition. Price? Extremely sparing.

[Baberdin] What is the effectiveness of the exhibitions? Can you cite the number of contracts and for their amounts at some or other exhibition?

[Shkuratov] There is not a single exhibition organization or a single fair in the world that uses such figures after its closing. The transaction is between the buyer and seller; moreover, this process is lengthy and involves many stages. It can only be planned at the exhibition.

But an exhibition is not only a meeting place for exchanging commodities, it is also launching pad for any initiative in the area of cooperation. And most importantly, it is an opportunity to see the world market of the sector and effectively test marketing plans. You get a wide survey at one place instantaneously.

And how do you measure those ideas which arise during conversations with colleagues?

[Baberdin] Vladimir Mikhaylovich, today the exhibition business is considered profitable; therefore, a large number of commercial organizations are being formed that are ready to provide the corresponding services...

[Shkuratov] This is a natural process. Just recently, for example, centers which we had in St. Petersburg, Minsk, and Donetsk have branched off from "Expocenter." The Nizhegorod Fair and the fair in Siberia have been revived. We are helping them in every way we can and do not regard them as our competitors. The exhibition market is broad enough, and with a reasonable approach there is room for everyone. The Union of Exhibitions with its headquarters in Nizhniy Novgorod was created precisely to coordinate the activities.

We are concerned about the unexpected appearance of various small private firms ready, they claim, to ensure access to any enterprise to exhibitions abroad. We were witnesses to their "punctures"—cases of an unprofessional and unscrupulous approach. Our advice to defense firms is to consult organizations having well-established reputations. Believe me, this will be cheaper for you and more comfortable.

[Baberdin] What can "Expocenter" offer this year for enterprises of the defense complex?

[Shkuratov] It all depends on the profile and interests of the firms. Ninety percent of the exhibitions which we will conduct, in one way or another, concern the interests of the defense industry and its conversion. The calendar of exhibitions this year is quite packed. For the first time we are conducting a fair at which a wide assortment of machines, equipment, and technologies will be shown—"Machine Expo." Such fairs are being conducted in various countries; we hope ours will also be up to par. I think the First Russian International Auto Show will be of great interest for the defense industry. This is our achievement. It has been registered in the international organization of automobile producers. We are awaiting the arrival of commissioners from France specifically for this. This will be a true inspection. But this is a prestigious inspection. We hope that our auto show will be on a par with those such as the Tokyo, Birmingham, New York, and Frankfurt auto shows.

Another interesting exhibition is "Zdravookhraneniye" [Public Health]. It is no secret how many aviation and space enterprises are now engaged in producing modern medical equipment—the Design Bureau imeni Lyulka, the "Energiya" [Energy] and "Kompozit" [Composite] scientific production associations... They have something to offer foreign partners.

We are placing great emphasis on the NUCTECH exhibition—nuclear technologies. It is being organized with good support of the government of the FRG, on the one hand, and the government of Russia, on the other.

[Baberdin] You talked about international exhibitions in Moscow. How will we appear abroad?

[Shkuratov] I am afraid it is not important. Now the state is not subsidizing such shows. Everything is being done using internal funds, but our leading firms do not have enough currency, and they are using it to acquire equipment and technologies. Throughout the world the state encourages development of exports, in particular through such a mechanism as international exhibitions. It provides incentives to its exporters by the fact that it partially (and completely in some countries) assumes the costs associated with such measures and grants tax exemptions. Unfortunately, our country lacks such mechanisms aimed at expanding participation of Russian enterprises in foreign exhibitions and fairs.

Who now goes abroad to exhibitions? Those who have enough dollars—commercial structures. And what do they

take to the prestigious fairs? Samovars, sets of nesting dolls, balalaykas. And they sell them there at a profit. The result is a deplorable picture—the country is losing, if it has not already lost, positions, image, and prestige.

We have prepared a whole package of proposals aimed at encouraging exports and changing the tax policy in this context, but so far the government has not heard us. In particular, we propose using commissions from international transactions made in our trading house "Expo RIA" to finance the participation of Russian enterprises in foreign exhibitions. We propose helping the same enterprise that made this transaction. In this trading house we are ready to act as representatives of those firms that have something to offer to the western market. Please, contact us. We are waiting for you at our "Expocenter."

19-23 April Exhibit in St. Petersburg Announced

*93UM0504D Moscow KRASNAYA ZVEZDA
in Russian 3 Apr 93 p 4*

[Announcement: "Lenexpo St. Petersburg, Exhibition and Symposium with International Participation on Conversion: Konversiya-93"]

[Text] Ladies and Gentlemen!

The LENEXPO Exhibition Association has the honor of inviting you to participate in the first exhibition and symposium in the northwestern region of the Russian Federation, KONVERSIYA-93, which will be held 19-23 April 1993 at the exhibition complex LENEXPO, pavilion No 5.

The exhibition is being conducted jointly with the largest organizations of industrial exhibitions in Germany—the firm Hamburg-Messe und Kongress and with the assistance of traditional foreign partners of the LENEXPO Exhibition Association.

The theme of the exhibition and symposium is:

- enterprises of the defense complex in market conditions—competitive equipment and technologies offered by conversion enterprises for export;
- opportunities of conversion enterprises in the area of light, food, chemical, fuel and energy, and electronic industries, shipbuilding, aviation, space, communications, construction, transportation and agriculture, and production of new materials;
- production of consumer goods to saturate Russia's domestic market;
- investment and credit policy in the area of conversion, specialized funds, solving problems of job placement for workers of enterprises changing their specialization, and the problem of preserving Russia's scientific and technical potential and scientific cadres in the process of conversion.

Contact telephones: (812)356-35-61. Fax: 355-19-85

**Potential for Converting Military Industry To
Farm Production**

*PM2204115593 Moscow ROSSIYSKIYE VESTI
in Russian 21 Apr 93 p 5*

[Veniamin Vylegzhanin report: "From Military-Industrial Complex to Agro-Industrial Complex"]

[Text] The problems linked with the conversion of military-industrial complex enterprises to the production of agricultural products have been discussed at the "Agrokonversiya '93" international conference.

Leonid Karmanovskiy, vice president of the Russian Academy of Agricultural Sciences, highlighted the main avenues which should be followed in converting military-industrial complex enterprises. These are primarily the need to organize production of promising, already assimilated equipment. The second avenue of conversion is to assimilate production of equipment where demand is not being met owing to the collapse of the USSR. Many agricultural machine building plants are now outside Russia. And the third avenue is to take part in modernizing and enhancing the technical standards of agricultural machinery.

In Leonid Karmanovskiy's opinion, we need to set up a unified program for the development of equipment for the production and reprocessing of agricultural output, using enterprises that are undergoing conversion, and to ratify that program at government level. He thinks it would be expedient to create favorable economic conditions for conversion and to set up a special investment fund.

The Russian scientist was supported by Eldon Griffiths, director of the International Business Center (United States). He said, in particular, that U.S. and British businessmen will be supporting Russian scientists and specialists and even financing the first trial project to the tune of \$150-200 million. It is quite possible that in the future foreign investors will allocate targeted loans for specific programs.

Fikret Guseynov, chairman of the board of the "Rosinka" Russian Agricultural Investment Holding Company, stressed that conversion along the lines of "frying pans instead of tanks" cannot be a success. Consequently, the businessman believes, one of the main avenues of agricultural conversion should be the use of developments and achievements realized at military-industrial complex enterprises in the sphere of the production of new materials, electronics, automation, and so forth.

Just what is hampering the rapid conversion of military enterprises to the production of output for the agro-industrial complex? The conference participants highlighted two main problems in this area—the poor legislative base and the inadequate financing of enterprises that are undergoing conversion. People here are looking to the government, which should act as the direct purchaser of the equipment rural people need.

The conference's Russian and foreign participants signed a memorandum giving great attention to the creation of a unified system—for the production, processing, transportation, storage, and sale of agricultural produce. The memorandum also envisages the creation of a pool of finance to mobilize funding and other resources in order to carry out conversion and to reequip the Russian agro-industrial complex.

Process of Conversion at Krasnoyarsk Defense Plants*93UM0313A Moscow IZVESTIYA in Russian
17 Dec 92 Morning Edition p 3*

[Article by IZVESTIYA Correspondent Aleksey Tarasov, Krasnoyarsk Kray: "Apostates From Krasnoyarsk-35—or a Second Marriage to the VPK [Military-Industrial Complex]"]

[Text] If not for a scandal at one of the military-industrial complex's off-limits "islands", we would certainly still not have known for a long time about the existence of a strictly classified plant-village approximately 60 kilometers from Krasnoyarsk.

Here they assemble and test missiles and produce cryogenic products. The name of the village that is surrounded by strands of barbed wire is Krasnoyarsk-35. Still another garrison-soldier found himself in the rank of those who had already received the news of the number plates of Krasnoyarsk residents—26, 45 and others. The enterprise that is located here—Fakel Chemical Plant—was previously an integral part of the decorated Krasnash PO [Production Association], the pride of the defense industry.

A year ago, the association was transformed into a concern when it became clear that Krasnash would not survive in the new atmosphere. The six plants that make it up—Fakel Chemical, Shtorm Machinebuilding, Metallist Metallurgical, Temp Refrigerator and Technical Equipment Systems Plant, and a mechanical plant—were registered as independent enterprises. The missile builders' empire fell and a completely new life arrived for the henceforth sovereign plants. Already begun in 1988, conversion has now become "wholesale" in nature. The arms producers set up production of equipment for medicine, microelectronics, culinary, and agriculture product processing.

Because the infrastructure and social-everyday life-cultural facilities of the divided plants was preserved as a whole, the concern was allocated a small amount of money and staff to carry out a number of common tasks for all of the enterprises. However, Former PO and Current Concern General Director V. Gupalov did not seek the easy life and did not think about "dembel" [translation not found]. And he was not mistaken. In Moscow, they suddenly recalled that Krasnash was a monopoly on the production of a certain strategic product. On 30 September 1992, Goskomimushchestva issued a directive on the transformation of Krasnash Concern into Krasnoyarsk Machinebuilding Plant State Enterprise by merging five plants (all of those listed above, except for the refrigerator plant)...

Such was the unleashing of the conflict that has continued for almost three months between those who had swallowed their will and those who did not desire to return to the stall of the owners and the military-industrial complex.

Fakel is on the leading edge in these battles because it has the most serious basis to defend its independence. All of Krasnash's former subunits are on the same square in the kray center and the chemical plant is hidden deep in the taiga. Fakel is not too closely tied to the metropolis by technological chains: at Krasnoyarsk-35, they worked with items from the famous Energiya NPO [Scientific Production Association] and from the applied mechanics NPO which is located at neighboring Krasnoyarsk-26 and that is famous for its spacecraft, and with missile-spacecraft of other enterprises and KBs [design bureaus]. During the first nine months of 1992, the fraction of production jointly with Krasnash at Fakel was a total of 13.5%. Having paid 1.5 million rubles, the plant planned based on the debts that it had obtained in the inheritance from Krasnash NPO and conducted thorough conversion without state subsidies. In their searches for work, the arms producers were not distinguished by their squeamishness: they undertook the production of refrigerator components. Previously, that had been the business of local corrective-labor institutions.

Fakel survived, today earns a profit and is creating new jobs. Salaries at the plant are higher than at many Krasnoyarsk enterprises. As compared to last year, the volume of production has increased and defense product output has declined by 28% and the fraction of production of consumer goods has expanded by 30%. There is one reason for all of this: The plant was granted greater economic freedom. In addition, Fakel submitted a request for privatization. Imagine how our generals and military-industrial complex bureaucrats reacted to that?

But not all of the concern's enterprises were so lucky. Shtorm, a purely military plant, advocates a merger because for it, abandoned aside by the state, that—is the only possibility for survival. It is capable of producing only a "primary product". In the spring, it was severely stormy at the plant: workers demanded an investigation of the concern and the administration, expressed no confidence in Gupalov and asked where their salaries and work were. According to Fakel workers with whom I spoke, depriving the plants of their independence and merging them into a state enterprise is nothing other than the embodiment of the unforgettable: seize everything and divide it. Under the new distribution Shtorm will not be subsidized by the state but by Fakel.

Krasnoyarsk-35 already has something to lose and therefore a taiga hotbed of counterrevolution is arising in the military-industrial complex's holdings. On 5 October a Fakel workers' collective conference did not give its approval for the merger. The leaders and workers of certain other Krasnash plants—those who have already found the strength to live independently—do not want to be reunited.

The Center reacted instantaneously: on 8 October Acting Minister of Industry V. Glukhikh signed an order removing all five plant directors from their posts. Without any explanation whatsoever...

Previously, the military-industrial complex was a pretty good provider for Krasnoyarsk-35. The lethal weapons that were produced here provided a very comfortable life. Fakel Director L. Podsokhin at one time visited the United States with a "people's diplomacy" mission. And they say that he was not ashamed to reminisce about his native village.

At the beginning of the 1960's, when Podsokhin and his comrades-in-arms had just graduated from the institutes, they were young, and they developed Krasnoyarsk-35's infrastructure in total compliance with Communist ideals: stylish swimming pools and a relaxation facility, a covered ice rink and an after-work sanatorium (all of this for 7,000 residents). They were built on the voluntary service principle with self-help and with money saved. Later they just informed the leadership: they needed to place the social-cultural-everyday life facility on the books.

Of course, right now the restricted Siberian cities are already not those secret reservations of developed Socialism that they were five years ago. On close inspection, Krasnoyarsk-35 did not turn out to be an exception. The same stingy assortment of food as at the kray center and at those same prices. Bandit activity—a new phenomenon for a village from the "Communist Future"—is increasing. Indeed, I still have not seen grates on the balconies or first floor windows.

The village budget is formed separately from the kray budget—it is directly linked to the Ministry of Finance through the restricted city of Krasnoyarsk-26. However, Krasnoyarsk-35 is not relying on Moscow. It is surprising but it is so: There are enough taxes collected for the local treasury for maintenance of the social sphere—all available housing and the kindergartens were recently transferred to the account of the village Soviet. And Fakel provides 85% of the revenue to the village budget. Krasnoyarsk-35 Mayor and Village Council Head D. Torgarshin said: if the plant is deprived of its independence, it will automatically be placed on the account of Leninskiy Rayon kray center tax inspection (Krasnash is located there). And that is financial collapse for the village budget.

Krasnoyarsk-26, which produces plutonium weapons and spacecraft and which produces truck trailers, semi-trailers and Sosnovoborsk Refrigerators, is located not far from Krasnoyarsk-35 in this utterly militarized and restricted godforsaken place. All of these cities are essentially appendages. Housing areas near enormous plants. Their welfare totally depends on the course of business at the enterprises. There is nowhere else to find work here.

The directors who are responsible for their votchinas [patriarchal estates] and for all branches of authority, and for the state as a whole, have currently found themselves facing a Hamlet-like choice and therefore have been forced to "rotate like a propeller". That is how V. Bogocharov, director of Sosnovoborskiy Machinebuilding Plant PO that has now been transformed into

Besotra Joint-Stock Company, expressed it. One of three city residents works at his enterprise. Bogocharov successfully attracts foreign capital. Conversion is also occurring at Krasnoyarsk-26. But there are more than enough problems that have been aggravated to the limit. Enterprises are reducing the number of jobs and are shifting to a 3-4 day workweek...

Podsokhin is expanding production and has already hired 200 unemployed people from Krasnoyarsk-26. But what will happen to the village when, having completed conversion, it is once again ordered to set out on the military path? No one knows that. Yes and they cannot know that. What do the interests of this Siberian village really mean when compared to the interests of the defense capability of the entire country? Fakel, just like all of Krasnash, is the same kind of monopoly in Russia and maybe this is proceeding entirely logically?

Fakel workers, and also Temp and the mechanical plant's workers, have still attempted to convince Goskomimushchestva [GKI] that, according to the law, its directives must be coordinated with the local authorities and with the workers collectives. And on 15 October GKI adopted a new decision that repealed the preceding decision, and in so doing stated: the 30 September decision had been made based on distorted information that had been submitted to Goskomimushchestva by the Ministry of Industry.

Nevertheless the Ministry of Industry left in force its order on the removal of the directors from their posts. This vague situation was preserved for a week. And then new figures entered the conflict of the expediency of the law and defense. Krasnoyarsk Small Kray Soviet of People's Deputies terminated the force of Acting Minister of Industry's V. Glukhikh's order. Kray Soviet Chairman V. Novikov sent the appropriate representation to the government in which the local authorities' decision is supported by the fact that V. Glukhikh's order contradicts the requirements of labor legislation.

Meanwhile, Goskomimushchestva, "as a result of the appeal of the Russian Ministry of Defense and Ministry of Industry, for the purpose of providing continuity of the production for most important defense products" once again intervened in the conflict. What did it do? It terminated the force of its previous (15 October) directive. After that, the main hero of the military-industrial complex drama appeared on the scene. Did it turn out that something had changed once it had decided to once again unite the divorced missile builders?

Krasnash's customer—the Ministry of Defense did not hurry to conclude a contract with the Siberians this year and has not paid for strategic production. Others would understand this to mean that their services are not needed. But—this is fantastic—the selfless Siberians have stubbornly forged the Homeland's missile shield. And the military-industrial complex has finally remembered its holdings in Krasnoyarsk.

We can understand Krasnash General Director Gupalov who has been left without his empire. However, the desire to preserve his power and post—is hardly the primary driving force of the conflict. A series of factors is certainly operating. And these are state interests—as the military-industrial complex's generals and the traditional Bolshevik sense of justice interpret them, when it is permissible to disregard the laws and the opinion of workers collectives for the sake of expediency. It would certainly be more to the liking of the Ministry of Defense and the eliminated Ministry of Industry to deal not with five independent plants but with one entirely dependent state enterprise and with "their own" director. In a word, there are a multitude of reasons why they fear the independence of the Krasnoyarsk military-industrial complex's fragments like the plague. That is why they are once again sticking them together into an unviable monster.

And does it make sense that Fakel would intend to totally refuse defense orders, that if the state is still concerned about the fate of defense production at Fakel, it could write into the enterprise's charter the obligation to carry out this work, without depriving it of its independence.

The second marriage, to which the Siberian arms producers are being compelled, is without love and without calculation. The Krasnoyarsk military-industrial complex has essentially already been divided into the "VK" [military complex], which it is in principle impossible to subject to conversion and the "PK" [industrial complex] which has, besides state and defense interests, economic interests. The directors of this defense industry sector are being transformed into businessmen from generals of industry who have persistently carried out the plan and who beg money and benefits from Moscow. I recently repeatedly became convinced of that and not just based on Fakel's example. Yesterday's "militarists" are seeking profitable orders for consumer goods and are concerned about the economy, etc.

The appetites of the military are not only capable of dooming the village of 7,000 to hard times but also—the main thing—of returning the commanders of industry to their previous state, of reviving the already dismantled, subjected to conversion consciousness of the directors—generals so that they can once again, while persistently asking for military orders, tiptoe before the capital bureaucrats.

Dependence will immediately return after merging the plants. Production efficiency will decline. Podsokhin fears this most of all... Will people with such varied economic conduct be able to operate within the defense complex? For some, earning money has become the priority task and others link their survival strategy only to handouts from Moscow.

The Russian Procurator General, who suggested that the Minister of Industry repeal the order on the release of the directors who are in disfavor and restore the plant's

juridical status, recently became involved in the maneuvers surrounding Krasnash. Later Russia's Highest Arbitration Court delivered its opinion, recognizing Fakel's demand against Goskomimushchestva as subject to approval.

However, they soon one by one put the apostates in the Krasnoyarsk military-industrial complex mill in their place. A series of sessions of the Krasnoyarsk Arbitration Court recognized the decision on registration, charter and the founding documents of the independent enterprises who were previously part of Krasnash as invalid. Fakel's fate was also resolved on 10 December, thus essentially the entire missile army has once again been assembled into one.

Having been returned to its initial state, Krasnash has once again been placed under the authority of the state. And therefore of previous problems. Kray Soviet Chairman V. Novikov, while commenting on the situation at the plant at my request, said: "The State must determine if it needs Krasnash's products in the future. If they say they are needed, but they once again do not find money, then there is only one thing left—to cut up the primary product into scrap. In principle, it will not be retooled."

Fakel, which does not wish to be in servitude once again, has meanwhile become feverish. It would be good for the village of missile builders to not use the methods of struggling for "sovereignty" that are accepted today in response to the methods that have been used to deal with it in which there is so little from the economic laws and so much from the past, when not only these plants but the entire country marched according to orders.

Conversion at Antey Electro-Mechanical NII

93UM0499A Moscow *TEKHNIKA I VOORUZHENIYE* in Russian No 1, Jan 93 pp 8-9

[Unattributed article: "Conversion at the Electro-Mechanical"]

[Text] *The Electro-Mechanical Scientific-Research Institute [NIEMI], part of the Antey NPO [Scientific-Production Association], has accumulated a great deal of scientific and production potential in the realm of developing and adopting complex electronics systems over the 50 years of its existence. We propose here to familiarize you with some of the scientific and technical achievements of NIEMI that have been freed up within the framework of the conversion of military production. One may request more detailed information from the address 121471, city of Moscow, Ulitsa Vereyskaya, 41, Antey NPO NIEMI. Telephone 449-92-18.*

The Antey Diagnostics System

This is intended for the automated monitoring of radio-electronic gear (REA) of various classes (analog, digital-analog, digital). It can be used to automate the monitoring of technological processes, create small

information and measurement systems and automate scientific and technical experiments.

The system is structured according to the bus-and-module principle on the basis of series-produced technical gear, and consists of permanent and variable parts. The permanent part includes a control computer and an interface unit (power consumption of 50 watts, mass of 15 kg [kilograms]). Domestic and foreign personal computers—YeS 1840/41/42/45, Neyron, Iskra-1030/31, SM 1810, YeS 7978, PK 8641 or IBM PC XT/AT and analogues of it—are used as the controller.

The composition of the variable portion (interchangeable modules and measuring equipment) depends on the object being monitored and the electrical parameters being determined. It can include any standardized or non-standardized measuring gear with remote control and interface modules. The system can be supplemented where necessary with a tape perforator and a photoreader.

The technical equipment is linked by a unified interface in the form of a common bus and interface modules, including the COMMON BUS—KOP (IEEE-488) adapter and the C2—COMMON BUS (RS-232) interface, which are installed in the interface unit. The modules (there are 21 in the interface unit) are of standard size (220 x 170 x 18 mm), and are executed in multilayer printed-circuit boards. The system of modules may be expanded by hooking up additional interface units.

The monitoring programs are executed by the users in the BASIC language. A series of operators providing for interaction of the system with measuring instruments and the objects being studied is provided in it for maximum convenience. The programs and the necessary data are entered from a computer keyboard, floppy or hard disk, as well as punched tape. The possibility of transferring the control programs from one type of computer to another without refinement is envisaged, as is the extraction of the results obtained from them in the form of a test record sheet on the display screen, printout, perforated tape or magnetic disk.

The machine independence of the system, the flexibility and simplicity of resetting the apparatus when creating various configurations of it for monitoring specific REA, the small selection of standard interchangeable interface modules and the use of an expanded version of the programming language all make it possible to reduce considerably the time for monitoring and diagnostics of REA and ensure its high reliability, both under conditions of experimental and series production and in performing periodic check-ups of the gear and routine maintenance and repair operations.

The design of the system is protected by originator's certificate on the invention, and it has been tested in operating mode at a number of defense enterprises in the electronics industry.

New Technology

Specialists have proposed a technological process for removing deposits from devices under protective caps in vacuum installations manufactured of stainless steel. It takes place at temperatures of 15 plus or minus 5°C and low current densities in a relatively simple electrolyzer. The metals settle out to the bottom in the form of indissoluble compounds, and are easily extracted for later recovery.

The composition of the deposits is chromium, vanadium and copper (with possible inclusions of silicon). The metals are subjects to electro-chemical anode dissolution using low-toxicity non-organic compounds that are neutralized in conventional treatment apparatus. Ecologically clean hydrogen and oxygen are released into the atmosphere therein. This technology makes it possible to increase considerably the productivity and quality of the treatment and improve working conditions.

The Sayfer-2 Computer

This is a specialized on-board digital computer intended to perform tasks in the control of objects in real time. Multiple-machine computer systems, as well as means of developing and refining software under both in-house and field conditions, can be created on the basis of it. A special machine code serves as the programming language. The true performance is 800,000 operations/second. The internal memory of the main memory and ROM is up to 128 kilobytes apiece. The number of basic types of commands is 32. The word length of the commands and information numbers is 18 bits. Power consumption is 150 watts, the dimensions are 470 x 150 x 215 mm and the mass is seven kilograms. It operates at temperatures of -50 to +65°C. Industrial output has been set up.

The EMS-2 PMK is Analyzing

This program-methodological complex [PMK] is intended for evaluating the electromagnetic compatibility of groups (no more than ten) of electronic gear (RES) on the Earth's surface or in near-Earth space and operating in the decimeter, centimeter or millimeter wavebands. It functions using the YeS 1840/41 personal computer and the MS-DOS 3.30 operating system.

The PMK performs the input and scanning of data on RES parameters and their locations and mutual orientation in space, and determines the compatibility of any two pieces of RES in a group between each other on the basis of frequency and power analyses of the interference situation. Information is issued on the conditions of incompatibility of the RES in the form of tables of incompatible combinations of frequencies and mutual orientations, as well as tables of the parameters of frequency channels of the penetration of interference.

The set that is provided includes the program documentation and a loading module, recorded on the customer's

diskette. The user interacts with the PMK in interactive mode with the offering of necessary commentary.

Reversing Gear

This consists of a housing, input and output rollers and a switching device with a rotation counter. It allows changes in the direction of rotation of the output roller in a certain number of rotations of the input with its direction of rotation unchanged. It can be employed in devices with sign-changing movement of an actuator. The transmitted torque is 200 g-cm-sec, with a service life of 100,000 cycles, impact strength of 35 grams and mass of 160 grams. It is being manufactured in series production.

The sets of documentation for the mechanism vary for rotation rates of the output shafts of 5, 10 and 20. The creation of devices for other values of the transmitted torque and reversing rotations is also possible. The design of the mechanism is protected by originator's certificate.

Small SHF Amplifier

This instrument is intended for frequency amplification and signal boosting in the centimeter waveband. It is executed according to hybrid microelectronic technology and is housed in an airtight casing. Its enhanced resistance to the appearance of spurious signal generation across a broad temperature spectrum is achieved by using gallium-arsenide field-effect SHF transistors and special structures in the transformer-linkage circuitry. It is protected against input overload. The protective circuitry, which blocks the device, is actuated in the absence of an input signal (it has function control).

The low power consumption (about three watts) makes it possible to use the instrument without special heat draw-off. The input and output power are 8—50 and 80—100 mW respectively. The amplification factor is eight. The input and output resistance is 50 ohms, and the dimensions are 155 x 39 x 6 mm.

Protective Device

This is used to protect elements of microstrip sections of electronic gear, used for various purposes and operating in the centimeter waveband, against damage from a high-level SHF pulse power (500 watts). It is made from *p-i-n* diodes with a waveguide input and microstrip output. The cutoff level is 35 decibels, initial losses are 0.8 decibels and the current consumed is 80 mA. The dimensions are 45 x 33 x 40 mm, with a mass of 35 grams.

The device may be executed with a microstrip input and output. The initial losses in that case are 0.5 decibels, the dimensions are 24 x 2 x 5 mm and the mass is eight grams.

The Antey NPO

If you need to know continuously the geographical coordinates of transport vehicles, "peg" their positions to a topographical map and determine the heading and direction to a destination point, you need only be equipped with the **navigation, survey control and orientation gear (ANTO)** created by the Scientific-Research Electro-Mechanical Institute on the basis of its own original developments.

The ANTO is an integrated navigational-computer system. It includes:

- an antenna and receiver for the signals of a satellite navigational system;
- a signal converter;
- an indicator panel;
- a computer;
- a distance-covered sensor; and
- a gyroscopic course indicator.

It is supported by a single operator. The operation of the system is entirely automated, and the operator only enters the initial data. The information is displayed on a digital display for visual readout, as well as issued in the form of the Manchester-P automatic digital code for interface with the vehicle's computer.

It operates in three modes:

"Radio"—using radio signals from special navigational satellites (NSZ);

"Autonomous"—with operation using autonomous sensors of the distances and headings traversed; and

"Combined"—when operating using satellites (with radio signals available) and autonomous sensors (in the absence of radio signals), with priority given to operations using the satellites.

The ANTO can determine with great precision, from any point on Earth and in a parking bay or in motion, the geographical (latitude and longitude) or Cartesian (Gauss projection) coordinates, the height above sea level, the standard time, the heading of the object, its distance from any of ten assigned destinations and the directions to them. It may be used in cartographic mapping, geological survey, rescue, firefighting and patrol operations or in the shipment of especially valuable or hazardous cargos. It is particularly necessary for transport vehicles that are operating in roadless areas, under a lack of points of reference and in sparsely populated areas or desert terrain. It can be mounted on any land transport—trucks, trailers or tractors (tracked or wheeled).

The ANTO has undergone all types of testing, and has been recommended for series production. The sale of finished items under contract is possible; further upgrading with the aim of improving the operating and technical characteristics and expanding the realms of

application, including for use on surface (maritime and river) transport, may occur as well.

The developers can provide assistance in adapting the apparatus for the consumer's vehicle.

Our address is 121471, city of Moscow, Ulitsa Vereyskaya, 41, NIEMI of the Antey NPO. Telephone: (095) 449-92-18.

Technical Characteristics	
Error in determination of Cartesian coordinates:	
—when operating using satellites	no more than 30 meters
—when operating using autonomous sensors	no more than 1 percent of the route traversed
Error in determination of heading	no more than 10 minutes of angle
Power-supply voltage	27 volts
Power consumption	no more than 0.6 kilowatts
Operating conditions by temperature	from -50 to +50°C
Operating conditions by relative humidity	98 percent
Mass	no more than 115 kilograms
Number of units	12
Overall volume	50 liters

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Klimovsk Stamping Plant Director Questions Course of Conversion Program

934A0631A Moscow *RABOCHAYA TRIBUNA*
in Russian 14 Jan 93 p 1

[Interview with Sergey Averin, director of the Klimovsk Stamping Plant, by Yuriy Kozlovskiy, Moscow Oblast; date not given: "The Version of the Director of the Klimovsk Stamping Plant who is Convinced that Conversion of the 'Defense Sector' Needs to be Carried Out Differently"]

[Text] The chairman of the country's military-industrial complex, Ustinov, was out of spirits. No one knew the reasons for his bad mood, and no bold spirits had been found to try to find out the reasons. So the procession moved silently through the plant. Ahead, jackboots squeaking, the chairman and behind him—the devotedly mincing-gaited retinue.

And it probably happened this way: directly in the line of travel—an enormous puddle. Not changing direction, Ustinov walks directly into it and, cleaning the mud off his boots in a manner done for effect, advances "through water as if through dry land." He is the only one in jackboots. Those accompanying are in laquered lace-up boots, but no one decides to go his own way. They all, looking devotedly at the chairman's back, also walk into the puddle. All except one, the director of the Klimovsk Stamping Plant Sergey Petrovich Averin. He calmly goes

round the unexpected watery obstacle, correctly thinking that you won't dry out all autumnal puddles by the feet of even the highest officials, you won't trample down...

An ordinary, common enough event but behind it is the essence of Averin. Never has Sergey Petrovich taken actions of which he himself would be ashamed later on. Incidentally, that is why he probably has never sat down in a puddle.

Only once did he get fixed up in a job "by influence": as an apprentice pattern maker in the tool shop of the Tula Arsenal, which had been evacuated in the beginning of the war to the city of Zlatoust. These were interesting times all the same, when one was able to hit upon a work bench or a machine-tool only by pulling strings.

Who was the benefactor of the seventeen year old lad. His father, Petr Alekseyevich Averin, who had worked his entire life as an armorer.

"You didn't let the old man down?" I ask Sergey Petrovich.

[Averin] I'd say not! I became a seventh category pattern maker there. I led a brigade. We made "Maxims," Kalashnikovs, airplane guns. It often would be like this: the guard, which must accompany a batch of guns, together with the director, are patiently waiting while the lads and I got each of them right. If all is well, a bonus there and then—a teapot of alcohol on the table.

[Kozlovskiy] The most vivid recollection?

[Averin] There are others. I was "reserved" up till the end. You understand—a munitions factory, a highest category fitter-pattern maker. But I wanted to be at the front of course. I tried to run off. A volunteer tank corps had been formed in Chelyabinsk. I was at the Urzhumka station, half way between Chelyabinsk and Zlatoust. I persuaded them to take me into a regiment.

It fell through. Our plant director and the military commandant took me off the train in Zlatoust. What was... They held me three days in a cell at the commandant's office. You ought to be shot they shouted. Who needs you at the front? And who will make weapons here?

We talked for a long while with Sergey Petrovich Averin, who had travelled the path from foreman to director at the Klimovsk Stamping Plant.

Having discussed this topic we talked our heads off about the fact that, of course, enterprises of the defense complex lived comfortably before. State appropriations, the best minds, the best conditions for creativity and work.

"Agreed," says Averin. "Ustinov got too much money for the "defense sector." Not everything here was justified. But I also cannot agree with what is going on now. Is this really conversion? Has everything here really been

thought out to the end? Take our enterprise. We have created one-of-a-kind lines. There are none such anywhere in the world. They surpass similar production units in the European countries and Japan many times. What—will you order them to be scrapped?”

[Kozlovskiy] But if they cut off state subsidies, will the plant come to a halt?

[Averin] Who told you that? Today I already have an order for 10 years in the future. Do you know what we are making? We are stamping blanks for coins from metal which previously went for bullets. Only it's a pity that they don't give us the right to mint coins. And to no purpose. You see, we have overloaded both mints. Both in Moscow and in Saint Petersburg. We have experience, thank goodness. You see we're the only ones in the country that like to make tokens of various kinds. In the West there are automatic machines all around. Cigarettes, sandwiches, water, newspapers... You throw a coin of the necessary value—and that's it.

[Kozlovskiy] Do you think that blanks for coins will still save the collective of Klimovsk armorers given the growing inflation?

[Averin] Today I tell everyone the words which I often heard from my father. Don't be in a hurry to leave the plant. Hold on. I am fully confident that the enterprise will remain standing in the present unordinary times. We have rather successfully mastered the making of electronic instruments which is new for us. We, by the way, are the only enterprise making cardiostimulators for the heart. Their operating life is 11 years and they are designed for 35,000 routines. This is only a few of the new directions of our work, but even they bear out my thought: our collective is not done for...

With such a director, I think, one is not done for exactly. How much has he succeeded in his own work at the enterprise? Rotary lines, special purpose machine tools with programmed control, the famous "Module," for which he received a State Prize...

From his youth he has set a minimum working day for himself—12 hours. Volleyball, mushrooms, the hunting that he loves, even the family—all this afterwards. Work first of all.

"I have," says Sergey Petrovich, "a kind of fury with its result. It, work, warms the heart most of all. Time will go by, I will not be the director but I will stay at the plant all the same..."

I got from the plant to the center of the city in a passing car. I got into conversation with the young driver in a comfortable Zhiguli. "To earn money now," he explained to me in confidence, "is as easy as pie. I've

taken out a loan. I've bought a good and sold it at double the price—that's all there is to it."

"Really," I ask, "is that the only way you young people live? And who produces this good or another?"

The fellow looked at me condescendingly. Well, what is there for him to say with such a silly little chap?

And I thought about Averin. About the fact that a person who has had a heart attack "plows along" at his plant for a very modest wage for the present times. Why most of all does he need to?

MOSKOVSKIYE NOVOSTI: Conversion Round-Up

Admiralty Wharves Privatization Plans

93UM0426A Moscow MOSKOVSKIYE NOVOSTI
in Russian No 5, 31 Jan 93 p 8

[Article from BMN Sankt-Peterburg: "Admiralty Wharves Preparing for Privatization"]

[Text] The production of military hardware at the Admiralty Wharves decreased by 72.6 percent in 1992. Not a single ship was laid down there for the first time in many years. Many vessels under construction were left without state financing. Only state subsidies (130 million rubles), which were directed chiefly toward the payment of wages, helped to avoid mass unemployment.

The conversion program for the wharves is oriented toward the construction of tankers with a dead weight of 7,000 to 45,000 tonnes, small fishing vessels and the production of consumer goods—pleasure boats, yachts and automated heating systems with improved efficiency (under Finnish license). The promised state support for the program (four billion rubles up to 1995) is clearly insufficient, and the wharves are thus looking for additional sources of financing. The prediction of experts from the former Department of the Shipbuilding Industry—either Russia will order new vessels or the yards will begin to build them for foreign firms, since they want quite a few (see BMN No. 40, 1992)—are beginning to come true. The Admiralty Wharves will be sending out the first two tankers for export this year. The enterprise intends to invest the funds received from those sales to modernize one of its shops and for the construction of fishing vessels.

The executives of the Admiralty Wharves are counting on receiving funds for conversion with the aid of privatization, to which they intend to attract both those ordering the vessels and their own suppliers. Negotiations on possible participation in the issue of stock for the wharves have already been held with the Baltic Maritime Shipping Company (the principal customer for the tankers), the Cherepovets Metallurgical Plant and a St. Petersburg bank. The enterprise will most likely be changing its form of ownership in the first half of 1993.

Gradual Process in Novosibirsk

93UM0426B Moscow MOSKOVSKIYE NOVOSTI
in Russian No 5, 31 Jan 93 p 8

[Article by Yevgeniy Viktorov: "Novosibirsk Oblast Should Preserve Its Military-Industrial Specialization"]

[Text] *That is the feeling of authors of a regional conversion program—scholars at Akademgorodok and the EkonoIIproyekt Institute—who delivered it to the oblast Soviet of People's Deputies the other day for discussion.*

Some of the enterprises in the local VPK [military-industrial complex] have already begun retrofitting. The aviation production association, for example, is assimilating the production of the An-38 light multipurpose aircraft. The first models of the craft, intended for local routes, will be assembled as early as this year. Sibtekstalmash is preparing for the series production of a whole range of high-speed looms. The innovations being offered to the customers of the defense industry include space radio communications systems, machinery for the towns, truck-mounted cranes and fifth-generation televisions.

The rapid re-orientation of the whole highly militarized region, however, is simply impossible—almost 55 percent of the total number of employees in industry are employed in the defense complex and allied sectors in Novosibirsk Oblast. The organization of the output of civilian products without a fundamental restructuring of production, along with the accumulation of funds for further development, is therefore being proposed in the first stage, and only then will the qualitative transformation of the defense complex across all areas of activity be started.

The telephone number of the oblast conversion administration is (3832) 22-34-77.

Private Brickyard Venture Organized

93UM0426C Moscow MOSKOVSKIYE NOVOSTI
in Russian No 5, 31 Jan 93 p 8

[Article by Lyudmila Streltsova: "The Omsk Missile Builders Have Started Their Own Business"]

[Text] *A group of retired officers has created the DS & K limited-liability partnership (TOO) to produce small-capacity brickyards.*

Just 15 people can support a yard putting out from 2.5 to 20 million bricks a year. It pays for itself in just six months. Private construction firms have become more active in Omsk Oblast, owing to the crisis in the state construction sector. They have also become the principal buyers of the DS & K yards. The partnership plans to expand production, taking into account the growing demand for its products.

The telephone number of the DS & K TOO is (3812) 31-92-07.

Powder Enterprise Conversion Threatens Shortages

93UM0426D Moscow MOSKOVSKIYE NOVOSTI
in Russian No 5, 31 Jan 93 p 8

[Article by "PF": "'Progress' Intends to Reject the Paltry State Order"]

[Text] *Conversion at the largest powder enterprise could leave Russia without ammunition.*

Defense orders were just five percent of the overall product volume at the Progress PO [Production Association] in 1992 (they were 60 percent in 1991). The general director of the association, Gennadiy Solodov, feels that the enterprise will scarcely be able to resume the production of powder if the need for certain types of ammunition arises in 1993. The more so as Progress intends to reject the current paltry state order, and employ the specialists making the powder in another shop.

Zarechnyy To Become Technopolis

93UM0426E Moscow MOSKOVSKIYE NOVOSTI
in Russian No 5, 31 Jan 93 p 8

[Article by German Lomanov: "A City That Was Closed in the Past has Become a Technopolis"]

[Text] *Favorable conditions are guaranteed to the enterprises registered in the city of Zarechnyy.*

Zarechnyy—located 40 km [kilometers] from Yekaterinburg and 30 km from the Koltsovo airport, the largest in the Urals—is one of the "nuclear" monocities whose enterprises and institutes were working chiefly on defense. A BN-600 fast-neutron commercial nuclear reactor is operating here and there is an active affiliate of NIKIET, the largest scientific-research and design institute in the sector. The specialization of Zarechnyy is radiation materials science, the production of especially pure gases, hydrogen technologies and the installation of complex heat-engineering equipment.

The small city (30,000 people) has a good construction-industry base and available industrial space that could accommodate various new types of production. Entrepreneurship has been developed vigorously here since the city has been freed of its status as a closed city—about 200 small enterprises and five joint ventures have been created, and divisions of two banks have been opened.

The enterprises in Zarechnyy being converted are already putting out civilian products—from automated welding and plasma pipe-cutting machinery to sterilizers for the preparation of home canned goods. One innovation of which they are proud in Zarechnyy is the ELA-1 installation, which has attracted the interest of physicians and cosmetologists. The illumination from a special light source eliminates wrinkles and produces the surprising effect of the rejuvenation of the skin.

The local administration and the leaders of Zarechnyy science and industry, however, quickly realized that occasional breakthroughs into the market—even with exceedingly promising innovations—would not save the monocity. Conversion took on a systematic nature only when the Sverdlovsk authorities conferred the status of a technopolis on the city of Zarechnyy.

The program for its development was founded on a start-up package of ten of the best scientific-research projects. Zarechnyy is moving from a conversion that forced them willy-nilly to put out domestic sterilizers to the comprehensive development of the territory, oriented toward high technologies and ecologically clean types of production that do not require large labor resources. They intend to create in Zarechnyy, for example, a complex for the manufacture of thermostable sorbents—materials that absorb impurities from liquids and gases. They are being made using original technologies protected by 30 originator's certificates. The circle of consumers is exceedingly broad—from the electronics industry and laser engineering to medicine and winemaking. Another project is the creation of a series of installations for radiation treatment, which will make it possible to obtain materials with new properties. Some projects, for example a plant for the production of especially pure gases, are oriented toward the foreign market.

Favorable conditions are granted to enterprises operating and registered on the territory of the technopolis. The participants in the program projects are freed from tax payments to the local budget for three years, and the foreign participants in joint ventures for five years. An enterprise is also freed of local taxes if it sells its hard-currency profits to the development fund of the technopolis. The administration of Zarechnyy hopes that the exceedingly modest benefits that can be offered by the oblast and the city will be expanded through federal ones—the corresponding documents have been sent to the government of the Russian Federation.

The telephone numbers of the administration in the city of Zarechnyy are (34377) 3-17-05 and 3-28-61, and the fax number is (34377) 3-36-37.

NITEL Director Kopylov Interviewed

934E0384B Moscow EKONOMIKA I ZHIZN
in Russian No 6, Feb 93 p 16

[Interview with NITEL Joint-Stock Company General Director Viktor Kopylov, by A. Sharshunov in the "On the Path to a Market Economy" column; place and date not given: "NITEL Contra Deficit"]

[Text] Nizhniy Novgorod—*The transformation of the Production Association Television Plant of Nizhniy Novgorod is more than a mere name change. The collective unanimously supported privatization through conversion to joint-stock operations largely because the enterprise is confidently asserting itself in a market environment, guaranteeing respectable and stable dividends to stock holders.*

Conversion, which has virtually become a bugaboo to others, is perceived by General Director Viktor Kopylov as a recognized necessity.

[Kopylov] We have largely foreseen the painful dislocations in the national economy, and have prepared for them, embarking on conversion before it was officially announced. Quite recently, 70 percent of the output was geared toward military technologies, and 30 percent toward the production of consumer goods. At present, the ratio is the reverse. First of all, we took up TV sets because a reliable production base appeared for boosting their output. A TV receiver of the fourth generation, Chayka-441, is competing successfully with foreign models, being on a par with them in terms of quality and technical parameters, but considerably cheaper. This device has 65 channels and remote control.

[Sharshunov] Conversion usually gives rise to a great many economic, personnel, and ethical problems. How do you solve them?

[Kopylov] I am opposed to neglecting the defense capability of our country in the process of beating swords into plowshares. It is just that the emphasis in the military-industrial complex should shift from quantity to quality. We strive to accomplish this. At present, our enterprise is the only one in the world which produces meter-band radar stations which operate in virtually any weather and are capable of confidently detecting even the "invisible" planes.

Through high-quality conversion, we succeeded in maintaining our unique cadre potential by offering highly skilled specialists interesting avenues for the creative exploration of both civilian and military technologies. After all, at present NITEL produces not only TV sets, but also satellite TV systems and video equipment.

[Sharshunov] Incidentally, the stability of personnel in your collective is striking against the background of forthcoming unemployment: In one year, as few as two dozen people have quit.

[Kopylov] I believe that in this instance, promising work and developed social facilities are the main reason rather than high wages. I am resolutely against those who believe that we should get rid of the unprofitable "addon," the social sphere, during the period of emergence of a market economy and the conversion of enterprises to joint-stock operations. On the contrary, we are developing this sphere because it ensures the stability of the collective on which a lot hinges. This is why we are generous in building houses, athletic clubs, recreation facilities, and auxiliary farms. Incidentally, the collective is not averse to allocating a portion of the dividends to such uses in the future, as well.

[Sharshunov] A market economy rejects isolation; it presupposes the existence of an extensive network of business relations on mutually advantageous terms. Would you agree with this?

[Kopylov] Certainly. We are open to partnership. We do not need investors; nonetheless, we are prepared to cooperate with those who will offer us new technologies, new solutions. We will make the most favored arrangements for such contractors, all the more so because we have already gained experience: For example, we have established the production of video players together with the Japanese companies Nichimen Corporation and Sharp. The market has given our enterprise freedom, but it also imposed a tremendous responsibility. To my mind, an optimal combination of these two categories means finding the right bearings.

NITEL Joint-Stock Company: telephone (8312) 66-30-23, fax 65-50-19.

AUTHOR'S NOTE: I request that the honorarium for this publication be transferred to the Economist charitable foundation.

Zelenograd Faces Difficulties in Defense Industry Conversion

934F0290A Moscow KURANTY in Russian
No 42, 4 Mar 93 p 4

[Interview with Zelenograd First Deputy Prefect Viktoriya Aleksandrovna Mitina by KURANTY Correspondent Nikolay Andreyev: "Zelenograd in the Ring of Obstacles"]

[Text] I remember how the lads from the neighboring village of Dzhunkovka and I gathered mushrooms on the site of the present Zelenograd with its 170,000 residents. Later, the Union electronics center was placed here at Nikita Khrushchev's initiative and the area was "protected" for a long time. Ninety percent of the city worked in the defense industry and didn't know failure in orders and resources. Now, Zelenograd has found itself in the ring of obstacles when the gold general's shoulder boards have been removed from it.

Our conversation with the city's First Deputy Prefect Viktoriya Mitina is about its current problems.

[Andreyev] Viktoriya Aleksandrovna, does it turn out that yesterday's good has become a crisis for the city?

[Mitina] Yes, unfortunately, our yesterday's industry which almost entirely serviced the VPK [military-industrial complex] is experiencing a profound crisis today. There are 26 major NII's [scientific research institutes] and plants in the city, each of which cost \$30-50 million at one time. Now it's as if the enormous sums have been temporarily closed down and are not producing the proper yield. Last year, production was reduced by 32% which, of course, worsened the population's employment problem. Of the 35,000 people who work in industry, 4,500 have left, 1,000 unemployed have been officially recorded and approximately 5,000 are looking for work.

[Andreyev] But from a distance, one can think that Zelenograd is making progress, I have in mind the intensive construction of housing...

[Mitina] A serious disproportion has resulted: the Moscow construction complex has developed as fast as it could in our city because it was assumed that 20,000 additional jobs would appear with the introduction of the information technology and electronics center. However, the center has come to a standstill due to the termination of financing. Twenty five thousand Zelenograd residents have been compelled to work elsewhere but the construction flywheel has continued to turn despite the lack of electrical energy and heat for the introduction of new production capacity.

[Andreyev] The fact is: they are tearfully begging for housing everywhere and for you it's as if it has become a burden.

[Mitina] Unfortunately the capital construction industry is incapable of rapidly reorganizing. We have repeatedly raised the issue to the Moscow government on the inadvisability of such intensive housing construction in Zelenograd. It seems as if they understand us there but they say: an entire construction conveyor belt has been developed but what do we do with the tens of thousands of builders? If we abruptly cut back on everything, there will be massive unemployment. Right now steps are being taken so that the construction flywheel in Zelenograd will begin to noticeably reduce its revolutions next year.

[Andreyev] So, military orders have been drastically reduced, production is falling, but where do we put the people?

[Mitina] Many young, intelligent engineering-technical workers are leaving major industry for small business. Approximately 3,500 small ventures which employ 12,000 people have already been organized in our city. What are they producing here? Primarily electronics: telephones, various communications devices, and radio instruments. But once again the problem: a lack of small free production floor space. Small business enthusiasts have been compelled to work, as they say, on their knees: in basements, in apartments, and they are also leasing buildings in Solnechnogorskiy Rayon.

[Andreyev] Well, this of course is not the fundamental path for resolving the knot of global problems that have arisen before the electronic giant. Obviously, the solution is large-scale conversion and both domestic and foreign investments. I know that you recently have been continuously receiving foreign delegations in the prefecture. Is there a real hope that foreign partners will help Zelenograd to acquire a second breath?

[Mitina] Yes, guests have begun to visit us more frequently. Approximately 200 foreign delegations from practically every corner of the earth visited the city last year. Our ideas and scientific-technical efforts are very attractive to them. But for now business people from the West are not investing a lot of their capital in the

conversion of our enterprises. First of all, they are looking closely, analyzing, and calculating: they will not invest dollars to no purpose. Second, the political and economic instability in Russia puts them on guard. Unfortunately, not lasting, long-term laws but individual personalities, whose replacement will result in everything being reexamined and changed, are defining our country's course for the time being. Uncertainty and delinquency are unacceptable for foreign businessmen. Our inflationary processes are doing a lot to prevent a business partnership with the West because naturally no one will invest resources in a economy that is in such terrible shape.

[Andreyev] I heard that Zelenograd has been declared a free economic zone. Satirists are making fun: how can it be a zone—and suddenly free? But what do you think?

[Mitina] Well, we have been nurturing this idea since 1988 and at that time it passed through all of the Union levels of authority and in 1991 a Russian Government decree was issued on the creation of a free economic zone in Zelenograd. But when the Gaydar government came to power, all of the decisions of the previous leadership were practically suspended, including with regard to tax benefits for free zones. And in general these zones were quite incompetently declared in Russia, entire oblasts and even krays suddenly became free economic zones. And, in my opinion, the Gaydar government acted properly when it suspended this process of "free zones". While proceeding from world practice, free zones must be local and behind a fence. Right now we are developing their concept based on our major enterprises.

[Andreyev] I know that you monitor industry and that you can talk for a long time about its pains and prospects. But you, as first deputy prefect, must certainly encounter problems of a socio-political nature. Today, the confrontation of executive and representative power is being seen everywhere. How is it in your prefect?

[Mitina] I would say that the prefecture has maintained mutually respectful relations with the gorsoviet [city soviet]. But nevertheless the internal opposition is quite strong. The gorsoviet's main principle is: the administration must be accountable to it in everything. And this principle is not because such poor uncles and aunts work there. We have not legislatively defined the balance of powers and we have not precisely designated their functions. That was the spark that set the forest on fire. If you talk about the big picture, the system of soviets is becoming obsolete.

At the same time, I respect the position of those people in the soviets who are sincerely concerned about preserving democracy and who are afraid that a new dictatorship will assume power from the executive branch.

[Andreyev] Viktoriya Aleksandrovna, Zelenograd is a worried city. They doted on Tatyana Koryagina here but then I heard that Zelenograd residents plan to recall their Russian deputy...

[Mitina] Our city often causes irritation and many forces have begun working to radically change the mood of Zelenograd residents and to change the flags here. Koryagina, Chelnokov, and Golovin came here on the eve of the April Congress of People's Deputies allegedly with a noble goal: to meet with and to talk with the residents. But they in fact caused a provocation—they "plucked" the resolution of a small group of people that condemns the president and reforms and submitted it at the congress as the opinion of all of Zelenograd. Suddenly a campaign began to organize the conduct of a VLKSM [Komsomol] unification congress in our city. This is a purposeful policy which, I assure you, is being formed not by us in the city but in the highest structures that are close to the CPSU. And Koryagina is only an element of that policy, a toy in the hands of those who develop and direct it.

As for Koryagina's recall, which began in our opinion from the moment of the election to all 180 and, essentially, was submitted to Zelenograd's voters... Many voters have aggressively advocated the recall of this deputy and an initiative group to collect signatures was formed at the meeting. But, as this campaign demonstrated, today it is practically impossible to recall deputies. They have developed this law for themselves which reliably protects them from the voters. First of all, only two months is provided for all of this work which is simply unrealistic. So, to collect the 15,000 signatures that are needed for our electoral district, first of all you need to recruit and organize a minimum of 500 signature collectors. Furthermore, the collecting of signatures at organizations, enterprises and at the place of residence is prohibited by law. The question arises: but where can you collect them? And one more thing: the initiative group to conduct this campaign must invest property worth five million rubles. In short, there are obstacles all over. Nevertheless, 7,500 signatures were collected for the recall of Deputy Koryagina in Zelenograd.

And in general intelligent people in the city are telling us: Well why worry about Koryagina whose figure fades in the background of the difficult problems of Russian rule. First of all, this is a question of the Congress of People's Deputies that today is the source of the destruction of statehood. They are certainly correct...

Profile of NKMZ Heavy Machine-Building Complex

93UM0511B TEKNIKA I VOORUZHENIYE
in Russian Mar 93 (Signed to press 3 Jan 93) pp 2-4

[Article by V. Zhuliy, chief of the advertising department of the joint-stock company Novokramorskiy Machine-Building Plant under "Science—Technology—Progress" rubric: "The Style of the NKMZ Is Uniqueness"]

[Text] The production complex Novokramorskiy Machine-Building Plant [NMKZ] is one of the largest machine-building enterprises in Europe. Its output has traditionally been distinguished by high quality and

exacting execution, which is the consequence of many years of experience in carrying out particularly demanding orders.

The official start-up of the plant was on 28 September 1934. From the very beginning the enterprise was oriented toward the production of machines and equipment that are unique in domestic and in many cases in world practice. One of the first and most interesting orders performed by the collective was the manufacture of a tunnel shield with a diameter of 10 meters for the builders of the Moscow subway. It was followed by a heavy-duty slabbing mill for the "Zaporozstal" plant. Its rollers are intended for the rolling of bars of metal weighing from 4 to 15 tonnes. The length of the products obtained reached 200 meters. The unit was the first in the world to be equipped with electric shears capable of cutting semifinished products up to 200 mm thick and 1.5 meters wide. It had a one-piece mount for which 187 tonnes of molten steel was used (at the same time that the renowned Krupp concern did not make profiled castings weighing more than 100 tonnes). On 27 December 1936, the slabbing mill entered the start-up phase.

The gates of the Volga Dam and the main component in the system of the grandiose structures of the Moscow-Volga Canal were raised by gantry cranes of a unique design built by NKMZ. Each 293-tonne crane had a main crane trolley with a lifting capacity of 150 tonnes. Depending on the water pressure, the load sometimes reached 300 tonnes. There was not a single breakdown in the work of the lifting mechanisms.

The plant was also destined to become the primary manufacturer of a gigantic continuous strip sheet mill for "Zaporozhstal." When the planned capacity was reached (600,000 tonnes of sheet steel per year) in September 1938, it was put into operation. The defense orders carried out by the enterprise in the prewar years were extremely interesting, in particular railroad artillery carriers—a 385-mm gun PT-1 and a 500-mm howitzer TG-1 whose overall specifications exceed those of any foreign model. The collective built a testing unit for the 406-mm gun B-37 manufactured by the "Barrikady" plant. The work was done in the scope of the program for the construction of a first series of Soviet superdreadnoughts of the "Soviet Union" type (full displacement more than 65,000 tonnes), each of which was supposed to carry three-gun 406-mm turret mounts for the main battery.

To carry out the order, NKMZ built two 250-tonne cranes, which were assembled in a 36-meter bay of the shop especially built for the assembly of turrets at the Leningrad Metal Plant. The MP-10 testing unit is notable in all aspects. The gun was turned horizontally by means of a gigantic spherical support with one-piece rings. In its characteristics, the 406-mm gun was unlike any other and significantly surpassed the guns of the main battery of the well-known battleship Bismarck. Tests of the mount, which began on 6 June 1940, went successfully. From 29 August 1941 through 10 June 1944, the 406-mm artillery

mount from the NKMZ participated actively in the combat operations in defense of Leningrad.

In 1948, the plant, restored after the war, exceeded the prewar level of production. The collective made a colossal contribution to the restoration of Dneproges, "Zaporozhstal," "Azovstal," and the mines of the Donetz Coal Basin. Somewhat later the start of the rocket and space age made some corrections in the fate of the enterprise. It became an active participant in the realization of space programs. It was precisely here where they built the launch complex from which the legendary "Vostok" carried Yuriy Gagarin into space.

The lease combine of NKMZ is now capable of satisfying any requirements in the unique technology of heavy machine building. Its list of merits includes the world's largest hydraulic presses, the most productive hot rolling mills, superpowerful rotor mining systems, walking draglines, ore-pulverizing mills, large-volume mixers, lifting machinery for deep mine shafts, very complex castings and forgings, and many other things.

The basic commodity of the combine is the semicontinuous and continuous rolling mills 1700, 2000, and 2500 for hot rolled strip steel, the plate mills 2000, 2800, and 3600, the mills 1800 for hot and cold rolled strip of aluminum and its alloys, and the mills 2800 for hot rolled aluminum strip and solid and compound steel rollers for different mills. They are highly productive, dependable, and durable. They fully meet the present technological level and surpass the best foreign analogues in a number of criteria and design solutions.

For example, the mill 2000 for hot rolled ferrous metals that was built on the basis of the very latest achievements of domestic science and technology was the first wide-strip unit of the new generation without precedents in world metallurgy in terms of productivity and technological possibilities. Its indicators for specific metal and energy-intensiveness are significantly lower than for foreign mills. There they achieved a world record level of production for one unit—6.1 million tonnes of sheet metal per year.

The combine is rightfully proud of its great successes in the area of press building. Here for various branches of industry they produce diverse stamping presses, forging presses with a force of up to 100 MN (10,000 tons-force), and crank hot-stamping presses with a force of up to 63,000 kN (6,300 tons-force). At the present time, the combine is prepared to deliver to consumers hydraulic stamping presses for different purposes with a power of more than 50 MN. The great rigidity of the mounts and the ideal hydraulic system for control and synchronization ensure high accuracy of stamping and convenient control of the working elements of the presses. Even in large presses, the misalignment of the movable crosspiece in stamping does not exceed 0.3 mm per 1 meter of length.

The collective has mastered the production of stamping hammers with a strike energy of from 125 to 1,600 kilojoules, horizontal forging machines with a power of

20,000 and 31,500 kilojoules, gas and hydrostatic units with a large range of technical possibilities, and various sheet-bending and sheet-straightening machines. The mark of NKMZ is found on the world's largest hydraulic stamping presses with a force of 500, 650, and 750 MN. The NKMZ has great possibilities in the provision of equipment to the mining industry. At the present time, earth-moving equipment from the NKMZ is used in stripping and mining operations at open mineral works under nontransport systems for mining work.

The combine manufactures the walking draglines ESh 6.5/45 having a scoop with a capacity of 6.5 cubic meters and a boom of 45 meters, ESh 11/70 with a scoop holding 11 cubic meters and a boom of 70 meters, and ESh 14/50 with a scoop holding 14 cubic meters and a boom of 50 meters, which is a modification of the excavator ESh 11/70. At the present time, the collective has begun to manufacture mining machines of a new generation: draglines ESh 15/80 and their modifications ESh 20/65 and ESh 10/100. The innovations include rotary excavators with a productivity of 6,500 to 8,000 cubic meters an hour. All of the mining machines may be operated at ambient temperatures of -40 to 30 degrees Celsius. This is accomplished through the use in their designs of alloyed steels and special systems of oil heaters in the drive mechanisms. Comfortable working conditions are provided for the drivers.

The traditional production of the enterprise is ball ore-pulverizing, core-type, and ore-pebble mills for the wet pulverization of ores and nonore minerals. The nominal working volume of these machines is 35 to 320 cubic meters and the diameter of the drums is 3.2 to 7 meters. It is enough to say that the plant ore-pulverizing mills process more than half of all the iron ore mined in the CIS.

The NKMZ is the largest supplier of powerful highly reliable standardized mine hoists with a difference of static tensions from 160 (16) to 400 kN (40 tons-force) intended for mine depths from 400 to 1,300 meters. All coal and many other mines of the countries of the Commonwealth are equipped with them. As desired by customers, the NKMZ manufactures mine hoists with cylindrical drums having a diameter of 4 to 6 meters. All of them are equipped with press-molding material blocks. A lift engine and equipment for regulation, protection, and automation are delivered along with the machines.

The steel-smelting, foundry, forging and pressing, and heat-treating shops of the combine completely meet its requirements for high-quality intermediate products. The metallurgical base of the enterprise has the possibility of manufacturing steel and cast-iron castings weighing up to 140 and 70 tonnes, respectively, 5-tonne castings from nonferrous metals, and 100-tonne steel press forgings. By utilizing the electroslag method of welding that the enterprise has mastered, the mass of the castings and press forgings can be increased to 350 tonnes.

In the metallurgical production of the NKMZ, use is made of about 90 makes of steel—carbon, alloyed, high-alloy, and smelted in basic and acidic open-hearth and electric-arc mills. The founders have mastered the processes of the manufacture of molds of sand and clay mixtures using the method of impulse molding with compressed air and molds and cores utilizing liquid self-hardening, cold-hardening, and plastic self-hardening mixes with inorganic binding and liquid curing agents. They have developed promising compounds of thermostable universal quick-drying inorganic nonstick coats. Their utilization improves the quality of the casting surface and makes it possible to obtain castings with a wall thickness of up to 400 mm and weighing up to 100 tonnes.

The forging-pressing and thermal treating shops of the combine are equipped with unique forging presses, horizontal and vertical heating and heat-treating furnaces, and facilities for the hardening of rollers with a barrel diameter of up to 1,600 mm through commercial-frequency currents. Steel for critical forgings is subjected to vacuum degassing. The forgings are manufactured using the method of free forging on steam-hydraulic presses with a force of 25 MN (2,500 tons-force) and 30 MN (3,000 tons-force) with manipulators having a lifting capacity of 15 and 30 tonnes, respectively, and on a hydraulic forging complex with a force of 100 MN (10,000 tons-force) and a manipulator with a lifting capacity of 120 tonnes.

The electric steel smelting mill produces bars of electroslag remelting weighing up to 30 tonnes for the manufacture of rollers for cold rolling and various critical workpieces. The metal obtained through this method is used to produce elements of gas and steam turbines, rollers, and tools. Extensive use is made of local electrothermic treatment of welded joints for workpieces enlarged with the help of electroslag welding. Mill specialists have mastered the thermo-chemical case hardening of large-scale pieces, gear wheels, and shafts. The quality of production is controlled through up-to-date methods. For example, the composition of smelted steel during the smelting process is checked by photoelectric systems and the correspondence of the finished products with GOST [All-Union state standards] requirements is monitored through ultrasonic defectoscopy and gamma-radioscopy.

The products of the combine are guaranteed high quality and reliability of welded metal structures. In their production, use is made of cold stamping, efficient thermal treating practices, highly productive semiautomatic welding in a carbon-dioxide medium, electroslag welding, surfacing, and other progressive technological processes. Electroslag welding with a fusing tip makes it possible to join in one operation semifinished products of carbon or alloyed steels with a rectangular shape and a cross section of up to 2,500 x 5,000 mm, whereas electroslag welding with wire electrodes permits the joining of cylindrical products made of steel of different strength levels with a diameter of 600 to 3,700 mm, a wall thickness of up to 450 mm, and mass of up to 250 tonnes.

At the NKMZ, they have mastered the mechanized oxyacetylene cutting of casting heads with a diameter of up to 2,600 mm on castings from carbon and alloyed steels. The machines used for these purposes are equipped with powerful ventilation systems and turntables for the stowing and turning of workpieces. Especially effective is their utilization for the shaped cutting of semifinished products from flat forgings. A machine modernized at the enterprise for the oxygen cutting of electrodes for electroslag remelting makes it possible to cut products of a complex configuration from flat forgings up to 900 mm thick with minimum allowances for mechanical processing.

To increase the service life of rubbing cylindrical parts (like the rams of hydraulic presses), extensive use is made of the mechanized facing of working surfaces of products with a diameter of 500 to 2,500 mm and a length of up to 20 meters by wire electrodes made of austenite steels. The high quality of the hydraulic drive mechanisms and the economy of their manufacture are achieved through the use of the automatic impulse electric-arc surfacing of cylindrical steel parts (pistons, rods) and through bronze alloys.

A set of equipment has been put into operation for the assembly and welding of cylindrical products with submerged-arc welding for narrow cropping. The distribution of the beads in the depth and width of the cropping is accomplished under a program for one, two, or three beads. The problem of welding circular joints of large products made of high-strength carbon or alloyed steels has been solved. The system provides for the welding of products up to 3 meters in diameter and up to 16 meters long. The thickness of the joint may be up to 500 mm. In the section for the manufacture of copper base plates and crystallizers for the equipping of electroslag-remelting furnaces, longitudinal and circular joints are welded under a layer of flux.

The basic organizational principle of the assembly of the combine's output is technological, objective, and specific specialization, which makes possible the maximum reduction of the manufacturing cycle of machines and mechanisms. Specialized shop sections have highly productive equipment, hoisting and transport systems and devices, and cutting and control-measuring tools. They are introducing innovations proposed by research institutes and laboratories. They have mastered rapid and circular drilling, finishing milling, polishing with continuous abrasive belts, finishing treatment of critical parts using the method of rolling and spraying with materials resistant to wear, and the processing of parts with tools having hard-alloy reinforced laminas and also laminas of superhard materials. They are successfully applying the technology of finishing treatment of gear wheels with a 40-mm module having a diameter of up to 4.6 meters at the sixth and seventh degrees of accuracy and a tooth hardness to NRS60.

The tool service of the combine provides for the manufacture and rational use of cutting and measuring tools.

Through its efforts, they have introduced strengthening technologies using methods of ion-plasma spraying, electric-spark alloying, and local thermal strengthening by laser beam, which made it possible to increase the life of the cutting tool. And it was possible to increase its service life by extending the range of brands of synthetic diamonds and superhard materials used and through electrodiamond sharpening of the cutting tools.

Under the conditions of the individual production of heavy machine-building products, the level of metrological support of production and the methods and means of controlling the quality of output are attaining paramount importance. The combine has laboratories and sections for the inspection and repair of instruments, which have been provided with highly accurate means of inspection. The shops for these purposes make extensive use of semiautomatic instruments.

The NKMZ clearly demonstrated its potential in the course of the realization of the programs for the first piloted flight into space and the building of the space complex "Buran-Energiya," the manufacture of propeller shafts for atomic icebreakers, and the production of a hydraulic stamping superpress with a force of 650 MN for the aviation industry of France and hydrostatic chambers for the testing of structural elements of the "Typhoon" submarine. Until recently the production of engineering obstacle-clearing vehicles was under the veil of secrecy. The former "facilities" manufactured in the scope of special orders from the Defense Ministry have now become commercial production. The experience gained by the people at the plant over the years of the operation of this equipment in the units and its use in combat in Afghanistan and in the elimination of the consequences of the Chernobyl disaster and the earthquake in Armenia was reflected in the enterprise's latest model—the engineering obstacle-clearing vehicle IMR-2M.

The output of the NKMZ has an excellent reputation in many countries of the world, including in Germany, Italy, France, Finland, and Japan. The high-capacity production, research, and experimental bases, the up-to-date technologies, and the extensive use of systems for the automated planning and regulation of production make it possible to build high-quality complex equipment capable of working flawlessly in prolonged intensive operation practically with no limit to the service life. With respect to its technical parameters and degree of innovation, it corresponds to world standards, is highly competitive, and can meet the needs of the most demanding consumers. Cooperation with the NKMZ is dependable and promising.

Orders and proposals can be directed to this address:

343905 Ukraine Donetskaya obl. g. Kramatorsk-5, ul. Ordzhonikidze NKMZ

Telephone: (06264) 4-89-77. Telex: 115137. Fax: 4-22-49.

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Interbranch Research Institute Offers Consultative Services

93UM0511A Moscow *TEKHNIKA I VOORUZHENIYE* in Russian Mar 93 (Signed to press 3 Jan 93) p C2

[Announcement by All-Russian Scientific Research Institute for Interbranch Information]

[Text] The All-Russian Scientific Research Institute for Interbranch Information (VIMI), being a head research institute of the defense complex, collects and analyzes scientific-technical and economic information and performs a broad range of investigations in the area of the development of engineering, economics, and technology.

VIMI is offering the use of the results of its system research, information production and services, files of documentary, descriptive, and commercial data banks and first-source collections, and consultation on ways to resolve problems in the development of engineering, industrial branches, critical technologies, and conversion.

By appealing to us in a timely manner on problems of interest to you, you will reduce the time and lower the cost of research and studies. This will help to raise the scientific-technical level, quality, and competitiveness of produced output and will permit you to open up new markets, to restore old and establish new business connections, and to identify domestic and foreign partners and competitors.

The basic directions of the work of the VIMI are:

- system research on the choice of the directions of the development of engineering, economics, critical technologies, and dual-purpose technologies;
- development of plans for specific programs for the development of engineering utilizing critical technologies and programs for the development of industrial branches;
- provision of analyses and information on the processes of conversion and the problems in the transition of defense enterprises to the production of new output;
- provision of research and studies with information and analytical materials from documentary and descriptive data bases and reference resources;
- independent expertise on scientific-technical production;
- publication of scientific-technical and information collections, manuals, and catalogs;
- organization and holding of conferences, seminars, exhibitions, and business meetings.

Beginning in March 1993, an exhibition-fair is being opened on a permanent basis at VIMI for enterprises of the defense complex.

The *objective of the exhibition* is the search for domestic and foreign partners in the sale of output, technologies, and services, the full utilization of free production capacities, investment in projects, programs, and cooperation, and the establishment of joint enterprises.

We await your orders at this address:

123584 Moscow, VIMI Telegraph: Moscow, "Induktsiya" Teletype: 111370 "Kopiya" Telephone: 491-66-67 Fax: 491-68-20

Information by telephone: 491-83-65 (contracts); 491-26-28 (subscription); 491-98-76 (inquiries); 491-83-04, 491-41-80, fax 491-73-84 (exhibition)

[Signed] Director V.V. Alesenko

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Defense Firms Offer New Civilian-use Products**"YaK", "Raduga" Sell New Yak-18T, Claim Edge on Cessna**

93UM0478A Moscow *KRASNAYA ZVEZDA* in Russian 30 Mar 93 p 4

[Article by Yuriy Zasytkin: "Yak-18T Once Again in Production"]

[Text] Thanks to the efforts of the "YaK" Aviation Corporation and the "Raduga" Production Association (investor), production of the four-seat Yak-18T aircraft has resumed after a long interruption at the Smolensk Aviation Plant [SmAZ].

Test pilots Vladimir Yakimov, Yuriy Mitkov, Vladimir Makagonov, and Mikhail Mochanyuk, who tested the first series-produced aircraft, note that the quality of its construction is higher than before. This is largely the result of extensive use of modern computer technology in the manufacturing process.

After some 15 flights, both according to the program and over and above it, in early March the Yak-18T was delivered to the Philippines to one of the first buyers. Experts believe that the aircraft has great advantages over the American Cessnas in conditions of high mountains and hot climate.

Earlier, the Smolensk Aviation Plant built 537 Yak-18T aircraft. Many of them are still flying in Russia, CIS countries, Cuba, and Bulgaria to this day.

It is planned to build 7 Yak-18T aircraft in March and at least 70 by the end of the year. But this will not keep up with demand. More than 100 firm orders have already been received, and their numbers are increasing daily. You see, this is the only series-produced aircraft on the

multipurpose light aircraft market of the CIS today, that is, the only really existing and assimilated aircraft.

Prior to beginning operation, the Yak-18T will participate in the Asian Light Aviation Show in Manila, and it will be shown at the Moscow Air Show-93 in late August of this year. Demonstration flights of the new aircraft, or more accurately the aircraft given a second life, will take place in the FRG in April of this year.

"Arktika" Turns from Nuclear Sub Components to Satellite TV

93UM0478B Moscow KRASNAYA ZVEZDA
in Russian 30 Mar 93 p 4

[Article by Capt 2d Rank Vladimir Gundarov, KRASNAYA ZVEZDA correspondent: "Both Submarines and Satellite TV Systems"]

[Text] The Severodvinsk Association "Raduga," which is participating in the construction of nuclear-powered submarines, has assimilated series production of a new product, this time for peaceful purposes—satellite TV transceiver systems. The Arkhangelsk residents and residents of the oblast—owners of this system—now can watch more than 20 television programs. Residents of the middle zone and the south of Russia can watch that much more. The number of programs received depends on the geographic conditions.

Creation of the new system is the enterprises' first experience in the development and production of complex electronic equipment under the conversion program. In the shop supervised by Dmitriy Yugin, a more improved model of the system is being prepared for production.

"Our enterprise," says Dmitriy Ivanovich [Yugin], "is the northernmost producer of satellite television systems in Russia, and we plan to supply the entire market of the northwestern region with these systems."

"Protek" Offers Geolocators for Cars

93UM0478C Moscow KRASNAYA ZVEZDA
in Russian 30 Mar 93 p 4

[ITAR-TASS article: "'Protek' for Motorists"]

[Text] A new instrument called "Kurtina" has been developed by the defense-worker designers of the Voronezh Scientific and Technical Enterprise "Protek." A special sensor installed in a motor vehicle is capable of signaling noiselessly around the clock, accurately giving coordinates. Experts believe that the instrument not only will help search for stolen vehicles, but it is needed for fire trucks, police vehicles, railroad containers and cars...

Khrunichev Plant Seeks To Market Robot Vehicle for Work in Dangerous Areas

93UM0522A Moscow KRASNAYA ZVEZDA in Russian
10 Apr 93 p 5

[Article by KRASNAYA ZVEZDA Correspondent Valentin Rudenko: "An Earth-Based Lunokhod [Lunar Vehicle]: If Only We Had Had It at Chernobyl..."]

[Text] When it became clear after the Chernobyl tragedy that we have an urgent need for "intelligent" robot systems, the Machine-Building Plant imeni M.V. Khrunichev was tasked to manufacture them.

The output produced by the plant eloquently attests to its scientific-technical potential and technological level. Suffice it to cite albeit the Proton launch vehicle which has launched into orbit an entire series of various sputniks and observatories, the Luna, Venera, Mars, Vega and Fobos interplanetary vehicles, and the manned Salyut and Mir orbital vehicles. The Almaz orbital station, the Kristall docking technology module that supports joint operation of the Mir complex with the Buran orbital ship and many other space objects, including military objects, were also developed here.

"We embodied robot systems in metal and the Institute of Physics-Technical Problems scientists and designers developed them," says Machine-Building Plant imeni M.V. Khrunichev Deputy Chief Designer Aleksandr Klychnikov. "It was proposed that we create an entire family of systems, beginning with small reconnaissance systems which would be able to enter into any room to mobile robots manufactured based on a heavy tracked vehicle. They were designed to eliminate accidents at AES [nuclear power plants], chemical factories, the dismantlement of wornout reactors, and in other locations that are a hazard to people's health. Unfortunately, we still haven't been able to realize what we have thought up due to economic difficulties. Only two robot systems—the KRT-101 and the KRT-200—have actually been developed and have undergone testing."

The KRT-200 is an improved version of the KRT-101. This is a medium class mobile robot with a broad functional purpose. The manipulators that are installed on it permit us to carry out loading-unloading operations, to gather radioactive fragments, and to carry out a number of other tasks with a high degree of complexity.

Each wheel of the system's chassis has its own engine and reduction gear which ensures very high reliability and an enhanced off-road capability under conditions of difficult terrain relief and on ground with a low load-bearing capability. Incidentally, the Lunokhod's chassis was manufactured based on a similar principle.

Command and control of the system is carried out by remote control through a radio channel from a special facility and, during operations inside buildings—through a mobile relay. You can watch from various points thanks to the movable television camera that has

been installed, thus increasing the possibility for a detailed examination of both individual objects and the situation as a whole.

The installation of a scientific apparatus for the conduct of various research, including for guidance to sources of radioactivity is provided for in the robot system. The KRT-101 and the KRT-200 have participated in a number of international exhibitions and have received a high assessment by specialists. They do not have peers based upon certain parameters. For example, these systems can operate under a higher level of radiation than Western, including Japanese systems.

An interesting detail—new assemblies and systems have practically not been manufactured for the KRT-101 and the KRT-200. They have been completely assembled from series-produced components and these components are 100% domestically manufactured.

Technical Specifications	
Weight, in kilograms	1,800
Dimensions (length X width X height)	2.8 X 2.5 X 1.9
Maximum towing force, in newtons	7,000
Radio channel operating radius, in meters	2,000
Number of levels of movement of the manipulators	6 and 5
Resolution of the television system from a distance of 3 meters, in meters	0.004
Cargo capacity of the manipulators, in newtons	50 and 700
Maximum capacity of radiation dosage, in Roentgens per hour	10

Heavy Lift Vehicles From Kurgan Truck Plant

93UM0499B Moscow *TEKHNICA I VOORUZHENIYE*
in Russian No 1, Jan 93 pp 10-11

[Unattributed article: "The Rusich—Your Reliable Partner"]

[Text] *The Kurgan Wheeled Prime Mover Plant (KZKT)—one of the largest Russian defense industries of the Transural region—specializes in the production of economical heavy prime movers (including military) and vehicles for mounting high-productivity earthmoving equipment. The successful operation of this hardware for many years under harsh climatic conditions (the West Siberian oil-and-gas region, the regions of the North and the Far East and the desert and sandy terrain of Central Asia, among others) has proved in practice the high quality and reliability of the plant's products.*

The MAZ-537 four-axle prime mover is intended for transporting heavy freight of up to 50 tonnes on a semi-trailer.

Mass, tonnes:	
—prime mover	22.3
—semi-trailer	68
Engine power, kW (hp)	386 (525)
Top speed, km/hr	55
Minimum turning radius, meters	15.5
Grade passable by tractor-trailer, degrees	8.5
Depth of ford traversable, meters	1.3
Cruising range, km	650
Number of seats in cab	4

At customer request a winch with a tractive force of 15 tonnes and a cable length of 100 meters may be mounted on the prime mover (MAZ-537 G)

The TMK-2 trench machinery is intended for digging trenches of various shapes and configurations in various types of ground, including frozen and partly thawed. Its auxiliary bulldozer equipment expands the range of operations performed, making it possible to perform the grading of terrain, filling of holes and ditches, digging of excavations and other operations.

Base vehicle	KZKT-538 DK (4 x 4) wheeled prime mover
Engine power, kW (hp)	275.6(375)
Mass of vehicle, tonnes	27.2
Productivity, meters/hour (not more than)	300
Top speed, km/hr	45
Fuel reserve, motor-hours	16

The KZKT-9101 heavy-load semi-trailer is intended for the transport of large loads with a mass of up to 53.5

tonnes when coupled with MAZ-537, MAZ-537 G, KZKT-7428 and KZKT-74281 prime movers.

Mass of rigged semi-trailer, tonnes	17
Width of trailer, meters	3.2
Top speed, km/hr	50
Load on trailer-hitch assembly of prime mover, tonnes	27

The KZKT-7428-011 four-axle prime mover is used to transport heavy loads with an overall mass of 50 tonnes on a semi-trailer.

Mass, tonnes:	
—prime mover	25
—semi-trailer	70
Power of engine, kW (hp)	478 (650)
Top speed, km/hr	65
Minimum turning radius, meters	15.5
Grade passable by tractor-trailer, degrees	12—14
Depth of ford traversable, meters	1.1
Cruising range, km	705
Number of seats in cab (sleeping berths)	6 (2)

A winch is mounted on the prime mover (KZKT-74281-011) with a tractive force of 15 tonnes and a cable length of 100 meters.

The enterprise will supply according to your order:

- all-wheel-drive four-axle prime movers for transport purposes for the shipment of heavy loads as part of a tractor-trailer with a semi-trailer;
- two-axle prime movers with all drive wheels, used for mounting earthmoving machinery with passive and active working elements;
- heavy-load semi-trailers for prime movers for the transport of large, indivisible loads with a mass of up to 53.5 tonnes.
- The diesel engines employed are most economical, and operate using cheaper fuel than those with a carburetor.
- The hydromechanical transmission, constant drive to all wheels and large-diameter tires provide the prime movers with high traction indicators and passability on all types of roads, as well as good stability when moving at top speeds.
- The use of steering control with a hydraulic booster and a braking system with pneumatic-hydraulic drive reduces driver fatigue and increases traffic safety.
- The installation of independent torsion-bar suspension on the control wheels of the four-axle prime mover, with two-way telescoping shock absorbers and a hydraulic-pneumatic suspension on the two-axle,

and spring-mounted driver seating creates comfortable conditions for the support personnel and reduces their fatigue.

- The forward position of the cab on the four-axle vehicles and the middle position on the two-axle provides a good view of the road when driving, and of the terrain when performing earthmoving operations.
- The equipping of the prime movers with a filter and ventilation system makes it possible to feed fresh air into the cab under very dusty conditions.

You may obtain additional information from the address Russian Federation, 640003, city of Kurgan, Ulitsa T. Nevezhina, 3. Telephone 5-68-13, 92-3-91; teletype 120255, 120262 ALMAZ; fax 58091.

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Fate of Munitions Industry

*93UM0376A Moscow PRAVDA in Russian
15 Jan 93 p 3*

[Article by Doctor of Historical Sciences Anatoliy Yegorin: "A Bullet—A Fool? Hardly... Alarming Comments on the Fate of the Russian Munitions Industry"]

[Text] The Russian border fence, so strong in previous times, has suddenly burst into flames in many places. Nearby territory shudders from the cannonade. Battles are occurring that encompass increasingly larger areas. And the politicians in Moscow only wring their hands in confusion; there is no military doctrine, the ratio between conversion and defense production has not been found, and there is nothing with which to pay the VPK [military-industrial complex] structures. Yes and it is unknown—what does the Russian Army primarily need: missiles, aircraft, tanks? Or maybe, munitions?

The maximum—that is what our armed forces need in full measure so that they can reliably defend our Homeland. The maximum—that is currently something more than what the Russian people, who have been exhausted by the crisis in the economy, can give. Russians are being subjected to attacks in villages and at military garrisons in various sectors of the border perimeter and even on its internal side. We are patiently bearing this but there is a limit after which collapse is inevitable.

Meanwhile combat support of the Russian Armed Forces has been reduced to a minimum. But even this minimum requires billions of rubles of expenditures for military equipment and arms, for their servicing and maintenance in combat condition. The Ministry of Defense under pressure from above is attempting to reduce even this minimum. On 13 October, Minister of Defense P. Grachev announced that strategic missiles have been partially removed from combat alert duty, that Russia will maintain the moratorium on nuclear testing at the Novaya Zemlya Range until the end of the year, and that Russia is not intervening in the Georgian-Abkhazian conflict. At the same time, the minister of

defense intends to reinitiate nuclear explosions beginning in 1993. Because, other than France, none of the leading nuclear powers has subscribed to the moratorium. It was announced that mobile forces are being created that will be located along the entire perimeter of Russia, that the 201st Motorized-Rifle Division, manned to the authorized levels, will remain in Tajikistan, that battalions from Volga Military District will be sent to South Ossetia, that troop withdrawals from Abkhaziya are not planned, that a Russian Group of Forces will be formed in Transcaucasus Military District which will be able to control the strategically important axes and, finally, in P. Grachev's opinion, the withdrawal of the 14th Army from the Dniester Republic is only possible after a final settlement of the conflict...

As we can see, the boundary between the maximum and minimum in the maintenance of the armed forces and their employment is relative under Russian conditions.

They are attempting to determine the strength of the army in the old way, purely by the "number of bayonets". They include in this concept not just troop strength but also the number of tanks, aircraft, missiles, artillery, ships... However, let's consider that. A tank is not a threat through its tracks but through its combat might, and through the yield and range of fire. Therefore, today not bayonets and other weapons for conducting war, in and of themselves, but munitions are the basis of the defense capability of the troops. In the First World War, Russian troops expended approximately 1.5 million rounds of ammunition per month. During the Great Patriotic War, the Soviet Army expended 17 million rounds per month.

Therefore, if we enter military production into our military doctrine that is being developed while taking into account the diversion of forces to conversion, we will have to define it not only through volumes of missiles, aircraft, and tanks produced, but also through the quantity of munitions that is capable of support the fighting power of the troops.

With the end of the Cold War and the destruction of the Warsaw Treaty defensive system, the United States was the first country that introduced substantial adjustments into its national security strategy. Its new military doctrine is "deterrence [sderzhivaniye] through intimidation [ustrashneniye] and reaction to crises". The United States has already managed to test the second half of this doctrine in practice during the 43-day Persian Gulf War. And what of it? If you take into account the information on the number of allied aircraft sorties and the total expenditure of aircraft bombs, it turns out that the expenditure of bombs per sortie is the same as at the peak year (1969) of the U.S. war in Vietnam. Therefore, no fewer munitions are needed today. And they must be super-modern, like the aircraft cluster bombs with anti-tank and anti-personnel mines, shaped-charge bombs, and combined shaped-charge, fragmentation-incendiary

bombs. The cost of one such cluster bomb is \$18,000 and their expenditure totaled approximately 30% of the total number of bombs.

As we see, not equipment itself, that is purchased in abundance or that has been stolen in nearby or remote foreign countries but the availability and massive employment of munitions is the decisive factor both in past and also in present military conflicts. In the current situation, precision-guided weapons are nearly replacing low yield nuclear weapons during attacks against priority and strategically important targets. The focus must be directed at them and not, as it appears, at their platforms when it is a question of military-industrial support of the Russian Armed Forces. And perhaps it is they that will determine the level of defensive sufficiency.

Last September at the Farnborough International Airshow, our aviation industry displayed its aircraft for the first time which had already impressed the West with their firepower several years ago. Now this armada of super-modern fighter aircraft, ground attack aircraft, and missile-equipped aircraft are being offered for unrestricted sale. I will point out that they are being offered not from the good life if you consider that the Goszakaz [State Order] for combat aircraft in 1992 was formulated at the level of 20(!)% of the previous level. The State has given up on its previously strictly classified KBs [design bureaus] and aircraft plants and it has authorized them to sell its unclaimed goods abroad, goods that in many parameters exceed Western models.

The West has begun to buzz like a beehive. The Russian KA-50 helicopter that was displayed at Farnborough can land itself at the take-off point in the automatic mode if the pilot suddenly loses the capability to control the aircraft. The helicopter's armor withstands a direct hit from an American 20 millimeter projectile and its weaponry ensures that a target the size of a briefcase is hit from a distance of 80 kilometers. How much better is our KA-50 than the American Apache-64 helicopter! Not only according to combat qualities but also in cost, the Americans are demanding \$20 million for their helicopter and we are ready to sell them for \$12 million. And other "stars" at the Farnborough Airshow were the TU-204 with British Rolls-Royce engines and the IL-96-300 with American Pratt & Whitney engines... It would seem, sell, toss us hard currency... But that's not the way it was.

First of all, who needs these "stars" without their weapons combat load, spare parts and components from subcontractors?

Second, it is not known what the State Order will be tomorrow or the day after tomorrow and what they will propose to produce within the framework of conversion: helicopters, projectiles, bombs, or—which is entirely likely—samovars...

Of course, the technology for producing an aircraft, a missile, or a tank is complex. The technology for producing munitions is even more complex. I would even

place production of munitions as the first priority. They don't advertise it too much but it is most important in the defense industry. Having announced conversion of defense production, we simultaneously gave our missiles a "zero flight task". We have sent the pride of our combat equipment to military business' display stands. We have mothballed tanks and cannons. Will we really not also cease the production of munitions? How and with what will we then defend Russia?

BMPs, Other Products From Kurgan

93UM0505A TEKHNKA I VOORUZHENIYE
in Russian No 2, Feb 93 pp 5-8

[Unattributed article: "Kurgan Machine Building Plant Production Association"]

[Text] This Association is among many which were absolutely closed enterprises until recently. Only a small circle of specialists knew what kind of equipment was manufactured here and how great was the plant's importance to the country's defense capability. Today the Kurgan Machine Building Plant is becoming better and better known not only in Russia, but also abroad thanks to the removal of many information restrictions.

The growing competitiveness of enterprise products and its high engineering level, excellent quality and reliability considerably contribute to this.

The plant is relatively young. The first models of equipment—artillery prime movers—came off its conveyor in 1954. Thirteen years later the enterprise mastered output of a completely new fighting vehicle which at that time had no world analogues. It was the BMP-1, which is well-known today. It was intended for substantially increasing the mobility and protection of infantry operating on the battlefield with tank support. Vehicles with a similar range of assigned missions appeared abroad considerably later.

BMP-1 Infantry Fighting Vehicle

Type	Tracked, armored, amphibious
Weight, tonnes	13.02%
Combat team:	
Crew	3
Assault force	8
Maximum speed, km/hr:	
Road	65.0
Water	7.0
Armament:	
2A28 smoothbore gun	73 mm
PKT machinegun	7.62 mm
9M14M ATGM system with single-channel guidance system	

In parallel with production of the BMP-1, plant specialists worked to upgrade it. Repeated modernization

resulted in the BMP-2 infantry fighting vehicle, created in 1980, which substantially surpassed its predecessor in many indicators. It is outfitted with a highly effective armament system, has reliable armor protection and high dynamic qualities, and is equipped with automatic devices for protecting the crew and assault force against weapons of mass destruction. This vehicle is recognized as one of the best in the world among similar vehicles in its aggregate of properties and characteristics. It earned such a high assessment of specialists by undergoing a series of tough tests, and it fully bore out that assessment during combat operations in Afghanistan. There are four compartments in the BMP-2 hull.

The UTD-20 220 kw (300 hp) four-stroke, liquid-cooled V-6 diesel engine with air and electric starting; a five-speed mechanical, synchronized gearbox; and two-speed side planetary steering mechanisms with belt stopping brakes are mounted in the engine-transmission compartment, which occupies the vehicle's hull nose. Developers used a compact, unitized version of a power plant in an attempt to reduce the nomenclature of assemblies and machine units and to simplify and lighten the design to the maximum. The ejection-type cooling system requires no fan and so does not require a complicated drive for it. Inasmuch as the vehicle is amphibious, the engine is fitted with an effective automatic system to protect against water getting into cylinders. The main (dry friction) clutch control drive is hydraulic with pneumatic backup, and the gearshift is hydromechanical. The power plant is simple in design and easy to operate, master and service.

The driving compartment is situated in the front left part of the vehicle. Controls and indicators of monitoring-measuring instruments are situated here in almost the same way as in an automobile, which considerably facilitates and reduces the driver training phase. Vehicle equipment [sic] does not require significant physical efforts. There is full information on the status of the engine and its systems on the instrument panel.

The hull midsection is occupied by the fighting compartment, where the commander and operator-gunner are located. An important advantage of the BMP-2 is a well-chosen set of armament, permitting successful combat against essentially any ground targets and also against helicopters and low-flying aircraft. The primary weapons (2A42 30-mm automatic gun and coaxial PKT 7.62-mm machinegun) are mounted in a rotating turret and stabilized in two planes. A Konkurs ATGM launcher is mounted on the turret roof plate. The twin-belt feed gun is capable of firing in three modes: single round, low rate (200-300 rounds/min), and high rate (550 rounds/min). The traverse is 360° and elevation is from -5 to 75°.

The gunner observes the battlefield and lays weapons with the help of a combination (day and active-passive night) periscopic binocular sight. The commander has a

periscopic monocular day sight, permitting control of fire against ground and airborne targets.

The assault compartment, located in the rear part of the vehicle, has ports for firing standard small arms (machineguns and assault rifles) without riflemen having to exit the vehicle. Large hatches in the assault compartment roof plate permit an assault force to dismount rapidly and also permit launching handheld surface to air missiles. The vehicle's power plant, transmission and running gear give it high dynamic characteristics and off-road capability. The BMP-2 negotiates water obstacles afloat without stopping for preliminary preparation. Movement is by a reactive force created by rotating tracks and by special reactive grids located in the rear. Lengthy tests and experience of operating the BMP-2 showed that the vehicle is identically well adapted to the most diverse road and soil conditions (sands, marshes, virgin snow, mountains) and climatic conditions (desert heat and freezing temperatures of high latitudes).

What is most attractive in the BMP-2 is that, while possessing high characteristics, it is simple and undemanding to operate, easy and understandable to master and, most important, it is reliable. That combination of qualities indicates that this vehicle is capable of performing a wide range of combat missions both as part of the subunit as well as independently.

BMP-2 Specifications and Performance Characteristics

Full combat weight, tonnes	14.0, 2%
Combat team:	
Crew	3
Assault force	7
Maximum speed, km/hr:	
Road	65
Water	7
Road range, km	550-600
Automatic gun caliber, mm	30
Aimed range of fire against ground targets, m:	
AP-T rounds	2,000
FRAG-HE-I and FRAG-T rounds	4,000
ATGM range of fire, m:	
9M111M2	75-2,500
9M113	75-4,000
Basic load:	
30-mm AP-T, FRAG-HE-I, FRAG-T rounds	500
7.62-mm cartridges for coaxial machinegun in unified belt	2,000
ATGM	4

The weapon stabilizer is electromechanical, two-plane, with laying from the operator-gunner and with target designation from the commander

BMP-2 Combat Capabilities							
Weapon/System	Target	Range, m					Remarks
		Maximum	Minimum	Maximum Effective	Effective	Aimed	
Konkurs ATGM	Tank	4,000	75				Kill probability 0.8; armor penetration 250 mm (60°)
30-mm automatic gun	Helicopter	2,500					75° elevation
	ATGM systems				4,000 with FRAG-HE-I		Continuous-casualty area 25-30 m ² AP-T; 50-70 m ² FRAG-HE-I against prone personnel
	Armored vehicles				1,300-1,500	2,000, AP-T	Armor penetration 18 mm (60°)
	Lone target				2,500, FRAG-HE-I, FRAG-T		
PKT	ATGM personnel			1,000	400-500		
Assault rifle	ATGM personnel				100-150		Sector 35-40°
Light machinegun	ATGM system				200-250		Sector 23°
Tucha (902 V) [type of smoke grenade launcher system]							Range 200-300 m

The enormous scientific, technological and production potential concentrated at the plant permits constantly improving the quality of products and expanding their nomenclature. Under present conditions, when there is an acute question of converting military production, the enterprise managed to quickly adjust the output of machinery and vehicles needed in the national economy.

One is the MKSM-800 small civil-construction vehicle for loading, leveling and moving dirt, moving cargoes, excavating rock, digging narrow trenches and drilling pits (depending on the set of mounted equipment). Its base chassis is supplied with an easily detachable device for mounting interchangeable tools: scoop, toothed scoop, dozer blade, stacking fork, fork with grapple, drilling rig, grader, road sweeper, and backhoe (excavator). The 43 kw four-stroke, three-cylinder diesel permits developing a speed of 12 km/hr and provides a nominal 800 kg of load-lift capability. The vehicle is highly maneuverable and easy to control and it has good traction indicators.

MKSM-800 Work Parameters

Weight, kg	2,845
Maximum driving force, kN	24
Lift force, kN	19.2
Breaking stress, kN	16
Clamping force, kN	22
Turn diameter, mm	2,350
Negotiable ford, mm	186
Permissible incline, degrees	10
Maximum loading height, mm	2,410

One other development by Kurgan personnel is for travelers. It is the KMZ-8136 trailer, which differs favorably from many similar models. It can be used to carry roofing shingles, sand, peat, sawdust, beehives, long loads, boats, tile and much more. The trailer's capabilities are considerably expanded by removal of wheel recesses from the bed, use of drop and extension sides, and use of an adjustable-length hitch bar.

KMZ-8136 Trailer

Technical characteristics of KMZ-8136 (numbers in parentheses correspond to the extension-side model)

Weight of equipped trailer, kg	160 (175)
Weight of load, kg	390 (375)
Bed volume, m ³	0.55 (1.10)
Bed area, m ²	2.23
Bed area with drop sides	2.83
Inner dimensions of bed (LxWxH), mm	1,850 x 1,240 x 250
The trailer is used with a motor vehicle equipped with the ST SEV2403-80 hitch bar	

The KMZ-012 minitractor with a set of mounted equipment, developed by enterprise specialists, is a good support for owners of orchard and garden plots. It possesses excellent maneuverability and good traction indicators and is easy to operate. The presence of a front and rear power takeoff shaft as well as a top strut

assembly and hitch assembly permits ganging it with a cultivator, cantilever mower, gang harrow, plow or hiller. The mechanical transmission enables moving at four speeds forward and two backward.

KMZ-012 Minitractor Technical Characteristics

Engine output, kw (hp)	8.82 (12)
Speed, km/hr:	
Forward	2.5...15
Backward	3.1...4.1
Number of gears:	
Forward	4
Backward	2
Wheel track, mm	700...900
Dimensions (LxWxH), m	1.970 x 0.960 x 1.346

The front and rear power takeoff shafts are dependent; front and rear hitches are provided

The Kurgan Machine Building Plant Production Association invites cooperation. Send requests and proposals to the following address: 640631, Kurgan, pr. Mashinostroiteley, 17.

Tel: (835222) 95-208 Fax: 33-996

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Samara Artillery, Clock Maker "ZIM" Ready for New Projects

93UM0476B Moscow KRASNAYA ZVEZDA
in Russian 30 Mar 93 p 4

[Article by Lt Col Oleg Bedula, KRASNAYA ZVEZDA correspondent: "The Familial Pride of Trubochnyy"]

[Text] *Every boy in Samara will tell you with pride that ZIM means nonelectric firing systems for cannons and the "Pobeda" clocks, the best in the world. I would add: the State Production Association Plant imeni Maslennikov [ZIM] occupies a special place in the Samara cluster of defense enterprises. It has no equal in number of workers, diversity of products, or age.*

Russia was just regaining consciousness following the confusion in the Russo-Japanese War. As a most important direction in the re-equipment of military production in 1910 according to the highest edict, construction of several state plants immediately was begun in Samara. According to the plans of the autocrat, they were supposed to become the best in Europe. In this sense, the importance of Trubochnyy was regarded exceptionally highly. During those days, Nikolay II sent a telegram to the Kazan Military District commander supervising the construction: "I sincerely thank all those present at the laying of Trubochnyy for the prayers... I hope that the plant will be built quickly and according to modern requirements."

In order to observe "modern requirements," the treasury allocated fantastic amounts of money for that time—five million gold rubles. The best engineers, masons, diggers, and carpenters of Russia were brought in. That is why the plant was built in a time period that is unlikely even for our times: in one and a half years. Its dedication was held on 14 September 1911. The Samara Trubochnyy was unequaled in Russia and Europe in level of equipment and technology being used in production. The domestic artillery in World War I was evidence of this.

Today, too, some 80 years later, the old shops are working for defense, captivating by their strength and efficiency.

The nonelectric firing systems, or rather primers, which boys have heard about and which became a symbol of the plant, have long since disappeared. They have been replaced by fuzes. The attitude towards there here is special—timid, biased, and respectful.

A vigilant brain, a thinking microlaboratory of a metallic plug stuffed with explosives—that is what a fuze is. The ZIM pyrotechnic, time, mechanical, hyrdroacoustic, radio, and laser fuzes are unlike any in the world. We are the indisputable leaders in the world here. For comparison, even the "Pobeda" clocks of the ZIM plant, which have the highest reliability and absolute accuracy, cannot at all compare with the conventional typical timer "product" for a number of basic parameters. The plant's products have never been advertised, although nearly every one of our shells, bombs, mines, missiles, and torpedoes are equipped with the Samara "toys." You see, in Russia, like in the former USSR, ZIM has a monopoly on a whole class of unique fuzes and other military items and technologies.

However, the General Secretaries did not always appreciate the enterprise's products. When Nikita Sergeyevich Khrushchev was told that Powers' U-2 had been shot down by a missile on which the best ZIM fuze for that time was installed, he merely shrugged his shoulders. As a result, production of the "thinking" product was reduced to a minimum... So, conversion for ZIM workers is not a new concept.

The plant has undergone conversion three times in its history: in 1917, 1937, and 1947. There also was a partial conversion in the early 1960's. Each conversion set back the plant 5-7 years in technological developments. When the party leaders were told about the threat of losing priority for a number of directions, menacing directives flew from Moscow to Samara: restore everything, recreate, and excel in everything. It was as if it were a matter of pushing the start button on a stopped assembly line... Months, years, and countless millions of rubles went to the restoration. Every time people did the seemingly impossible, again and again, surprising the devoted with unique developments.

Like natural disasters, conversion taught the plant much. And when the next campaign to curtail number items, lamp holders, magnetos, machine tools, and clocks were

placed on the assembly line... In this way we managed not to lose personnel, not to break continuity in generations of masters, and to preserve the school of creatively thinking, gifted designers and engineers.

That is what is taking place now, too.

When in 1991 the government promised that the plan for output of the basic—defense—product could be brought to the 60-70 percent level and then repeatedly reduced this figure, the ZIM workers did not panic, even though such tricks would have meant inevitable bankruptcy for another enterprise. They set up production of air distributors, machine tools, timers, medical equipment, security alarms, and many other things.

They once showed all this to Japanese businessmen. They were amazed: Is it conceivable to produce world-class items with such a process? Nevertheless, they proposed joint manufacture of a prototype overlock. They struck a bargain, but the Japanese, scrupulous in business, for some reason changed their mind. They did not believe in our capabilities, and we made a decision at the plant and undertook to make the overlock ourselves.

By the way, we called the Japanese a year later: we had made a prototype. It surpasses world standards for a number of characteristics. "That cannot be!" the Japanese became excited. They came here. They meticulously inspected everything, felt it with their fingers, and agreed that there was not yet a sewing machine of this class in the world.

Almost the same thing happened with the British. Yearning for real work, the ZIM left-handers began working on an order for the VAZ Motor Vehicle Plant for a vacuum amplifier. The British, the only holders of the appropriate documentation, laughed a little with restraint over the fact that they had given up on it as a hopeless cause. This required high technologies and genius brains...

A year later, the general director, Nikolay Grigoryevich Krichanov, in his office placed that same vacuum amplifier before the stunned islanders.

"And the plant has mastered production of a vibrocanner of its own design—the only instrument of its kind in the world, which has literally saved immobilized patients," I was told by the general director's assistant, Asya Novikova. "And the cosmonauts cannot praise it too highly. We produce the 'Liman' anesthetizing instrument, which makes it possible to get by without narcotics, an apparatus for artificial ventilation of the lungs, a tonograph for measuring eye pressure, an instrument for acupuncture... The motor vehicle innovations include an electromagnetic injector to replace the traditional carburetor..."

And what an injector! After visiting one of the exhibits, the Americans are asking to have a gyroscope made for their "Shuttles." The general director has in his briefcase

dozens more of the most profitable offers from various firms from all over the world.

So, maybe there is no big problem that instead of the unique fuzes the plant will switch to mass production of equally unique peacetime products? Especially since the volume of their sales are increasing at an inconceivable pace—last year alone it increased 12.5-fold, and so the average wage here in the future could become the highest in the region.

"No, we do not have the right to reduce the output of defense products below that level at which the production chain is broken. Not to the state or to the people," Nikolay Krichanov said even with some pain. "Our military products will still be so needed! But if equipment is mothballed even for 2-3 years, the level of quality will be lost forever..."

"It is the same as taking a boxing champion out of the ring for a year or two and then demanding new victories of him," Krichanov made a bitter comparison.

It is not just the general director who is experiencing this. Numerous plant dynasties, as they are called, grew up on these same fuzes. The grandfather created them, the son improved them, and the grandson improved them, and the great-grandson cannot think of a path other than working at the most respected production facility.

But then again, the once ancillary production has proved to be the mainstay—the "clock makers" and metallurgists. They are the ones who kept the industrial giant on its feet when it was deprived of the lion's share of orders. But such a situation was for many a signal to make a more decisive defense of the idea of independence through transfer of the association into a joint stock company. They do not want to keep the huge ship afloat on the rough market sea through their own efforts alone. This has put the captains of several production facilities together with the chairman of the labor collective council, Nikolay Pereverzev, in opposition to the general director.

"If there are too few military orders, we need to switch to a peacetime footing immediately," Pereverzev said to me. "It is annoying that Nikolay Grigoryevich [Krichanov] continues to believe in a miracle..."

Yes, Krichanov, calling Moscow each day and sending messengers "to clarify the situation" on the defense question, stubbornly believes that the country needs their military product. The army cannot get by without shells!

I do not know how it is at the top state echelons, but there is no question that the ZIM workers, engineers, and designers realize its true place in the military-industrial complex structure. They proved this when they had free elections for general director. Krichanov became general director, although other candidates also promised a wonderful life without military orders...

Nikolay Grigoryevich [Krichanov] believes that people also voted for the future of the Russian Army, for whose sake they are ready to endure much here. They voted for their personal, familial involvement in protecting the fatherland, which has been considered the highest valor in the Volga region from time immemorial. In this self-denial, to many they seem to be impractical miracles. So be it. You see, not many know that during the

revolution, during repressions, and during war, the plant's historical record of service was open on the page with the highest telegram of a true pioneer and spiritual mentor of the legendary Trubochnyy: "...to pass to all ranks my heartfelt gratitude for the work put forth, I believe in their willingness to serve henceforth for the sake of the homeland and to the glory of the Army that is close to my heart..."

Current Plight of Ship Building Industry

93UM0376B Moscow PRAVDA in Russian
14 Jan 93 p 6

[EFIR-DAYZHEST article, under the rubric: "Achievements of 'Democracy'": "They Have Sunk"]

[Text] Not a single combat ship was laid down for the time in Russia in 1992. Existing ships are breaking down one after the other. The majority of ships are laid up due to the shortage of fuel. The ports at Baku, Krasnovodsk, Liepaya, Riga, Tallin, Kerch, Odessa, and Sevastopol have turned out to be abroad. The situation is extremely serious at Russian ship plants. After the resubordination of five ship plants, including Nikolayev, to Ukraine, the Russian Navy has been practically deprived of ship building and ship repair facilities.

As a result, one of the Russian Navy's flagships, the heavy aircraft-carrying cruiser Minsk which is just 15 years old has been towed to the military ship graveyard due to the impossibility to repair it. For comparison: U.S. aircraft carriers have been serving since the postwar era. The Minsk's fate also awaits three remaining Russian aircraft-carrying cruisers—Kiev, Admiral Gorshkov and Novorossiysk.

During the last six years, the number of multi-mission submarines has been reduced from 340 to 166. The missile cruiser Slava, which was at Malta in 1989 during the meeting of Bush and Gorbachev, is threatened with being written off for scrap due to a lack of resources. The fate of the missile cruiser Admiral Lobov and a number of others is under threat.

Construction has ceased on more than half of the ships that have already been laid down. Russia will not receive such giants as the command and control and intelligence-gathering ship Pridneprovye that has been privatized by Ukraine and renamed Slavutich, and the heavy aircraft-carrying cruiser Ulyanovsk which is being cut into scrap at Nikolayev. But the greatest loss is Varyag, in the development of which 36 ministries and more than 300 plants participated. The loss of Varyag by Russia places in question not only her prestige but also the future of her Navy.

Recently Almaz Production Association General Director Korolev, having turned over the last Zubr Class hydrofoil assault ship to the Northern Fleet, recalled the words of U.S. Deputy Secretary of Defense Atwood: "It would be cheaper to give Russian plants \$10 billion so that they could be retooled and could not make these ships than to overtake Russia in this direction." Russia has saved the Americans these \$10 billion by having ceased the production of Zubr's at her own initiative, although Zubr does not have any equals in the world today.

Work has ceased on the multi-mission nuclear destroyer code named Anchar, which has no equals and on a number of other promising ships. The YAK-141 fighter

aircraft for the Navy, that caused a furor at Le Bourget, will not enter series production. An entire direction in aircraft design is dying with the cessation of work on the production of aircraft for heavy aircraft-carrying cruisers. Work is being terminated on the development of Spasatel, the world's first search-and-rescue wing-in-ground effect vehicle. Meanwhile, Russia has outstripped the United States by 12-17 years in the development of the wing-in-ground effect vehicle. We have information that the Americans are now inviting its designers to work on a wing-in-ground effect vehicle for the U.S. Navy.

As of today, the navy needs 350,000-360,000 personnel. However, as Minister of Defense Pavel Grachev recently reported, they managed to draft only 28% of the conscripts into the armed forces in the fall.

One more misfortune has recently been added to all of the misfortunes that have come crashing down on the seamen. After Ukraine paid \$2,000 each per month for the training of each Russian cadet, it became clear that the Navy is being deprived of four of 11 schools. But if the Navy could still survive the loss of the Kiev and Caspian schools, it is more difficult with the loss of the Sevastopol schools. The School imeni Nakhimov—is the only school where specialists who maintain missile-carrying ships have been trained and there are no schools like the engineering school in the training of cadres to service nuclear power plants on submarines.

We can also talk for a long time about the navy's personnel problems, specialist training, the ghastly state of the navy's gigantic lighthouse management program, and about the chaos at Naval depots, the consequence of which became the munitions explosions in the Northern and Pacific Ocean Fleets and about the wholesale sale of naval equipment. The Russian Navy will soon be 300 years old. But we don't understand one thing in this situation: what are Russian seamen planning to celebrate?

Marine Gas Engines from Mashproyekt

93UM0505B TEKHNKA I VOORUZHENIYE
in Russian No 2, Feb 93 p 9

[Unattributed article: "Engines for Gas Pipelines"]

[Text] For over 35 years the Mashproyekt Scientific Production Association and Zarya Production Association have been creating and producing ship gas turbine engines widely known in the Navy and the national economy. The production of reliable, economical GPA-16 gas compressor units with the second-generation DZh59L2 16-MW 30-percent-efficient engine has been mastered here since 1988. Over 50 units of this type already are operating in the national economy at the present time.

The first model of the GU59 gas generator was fabricated for this engine at the Mashproyekt Scientific

Production Association. It is to replace Eyvon gas generators which have used up their service life in British Kobera[transliteration]-182 gas compressor units being operated in the country.

The GPA-10 gas compressor unit with DR59 10-MW 27-percent-efficient gas turbine engine was developed and series-produced in 1989. The gas industry already has received 498 GPA-10 and modernized GPA-10-01 gas compressor units, which are installed at 35 compressor stations on 11 gas mains.

The Mashproyekt Scientific Production Association offers its developments for modern gas compressor equipment to all interested organizations.

Our address: Ukraine, 327018, Nikolayev, Oktyabrskiy pr., 42a, NPO Mashproyekt. Tel: 22-13-48. Telex: 272136.

Material on using Mashproyekt NPO ship engines in thermal electric power stations was published in our journal No 9-10, 1992.

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Impact of Conversion on Yantar Shipyard, Russian Navy

93UM0457B Moscow KRASNAYA ZVEZDA
in Russian 13 Mar 93 p 5

[Article by KRASNAYA ZVEZDA Correspondent Captain 2nd Rank Valeriy Gromak: "'Yantar' Is Changing Its Production Structure"]

[Text] Already yesterday to openly mention the Baltic Yantar Shipbuilding Plant in the press, all the more so to talk about the product it produced was unthinkable even though the majority of Kaliningrad residents knew: Yantar builds combat ships for the Navy and not only row boats, kitchen furniture and toys. The last ship was the Destroyer Neustrashimyy. The Flag of St. Andrew was raised on it in January 1993.

It was noted a long time ago that you could judge a country's overall development according to the level of the state's navy. Today they are not rejoicing over Russia's Navy and they are not talking anymore about the ships that no one needs that will be rusting for years in its coastal waters. And putting the Destroyer Neustrashimyy on line in the background of that—is a marked step in the formation of the new Russian Navy. But will there be a next one? And if there will be, when? Today the military order at that same Yantar has fallen to 25%. Previously, it totaled 85% of the total volume of production.

Recently I had the opportunity to hear from one high rostrum: they said, no one is threatening Russia and it doesn't need that Navy. It's possible that it doesn't need the one it has right now. We need a new, modern Navy.

I will point out: Not one Navy order has been frozen at the U.S.'s shipbuilding wharves in recent years. Modernization of existing ships is occurring along with the construction of new ships. They only dream of such modernization in the Baltic Fleet. Only two ships have undergone modernization here in recent years...

On the day of my visit to the plant, the SKR [escort vessel] Bodryy came in for replacement of its main engine. The replacement of the acoustic system and weaponry is occurring on one other escort ship. However, the plant has not received a single kopek this year for the repair of this year and for two months workers have been, as they say, expending efforts gratis. The collective resorted to that risk in the hope that the Navy's leadership will ultimately find the required monetary resources.

"The hand is not being raised to cease work," a specialist told me bitterly, "the ship is practically ready and we need to conduct mooring tests in about two months"...

Today the terminal and turn over shops at Yantar, which has everything required to repair ships, are not operating. At the same time, Navy ships are also standing in anticipation of repair—the required financial resources are not available...

Recalling that they shouldn't count on assistance in the situation that has developed, the plant's leadership is taking all steps in order to preserve unique highly-skilled cadres.

Last year, in general the outflow of workers ceased. And this despite the fact that the fitting out shop is at a near standstill. Nearly 150 female-painters have been left without work at two other shops.

"Economists think that we should release a portion of the workers," said Plant Director Leonid Zmachinskiy, "but I am not going to do that. You don't need a great mind to run people off. Your head should hurt about how to provide work for people. And the plant has that prospect."

Since 1991, Yantar's leadership has been actively seeking orders for the construction of merchant ships. They managed to find their first customer in Germany. How strange it seemed to them... The Estonian Steamship Line. It ordered a series of five large dry-cargo ships from the plant. Having received the prepayment in hard currency, Yantar began to build the first combined tweendeck ship. At the same time, a contract was concluded with Northwestern Steamship Lines (River) for the construction of 10 "river-sea" ships. They laid the keel for a timber ship for Baltic Sea Steam Lines at the shipbuilding dock. Recently, a contract was signed with Western Steamship Line for the construction of 10 "river-sea" ships.

While formulating the package of orders for the future, the plant is conducting continuous negotiations with its

long-time customers—the MF [Merchant Fleet] and Navy Shipbuilding Directorate in order to maintain and complete the combat ships that have been laid for the Russian Navy. Today, a new series of combat ship is half finished and the construction of two escorts with a displacement of 400,000 tons are under construction...

Recently, Leonid Yanuaryevich was in Norfolk and visited the heads of the firm Metromachine. The American director is nurturing the idea of building a series of tankers on a fundamentally new basis, jointly with Yantar and one of Sweden's wharves. This proposal suits the Yantar collective, all the more so that the American colleagues are allocating resources for reconstruction of the plant.

The Baltic shipbuilding plant urgently needs these resources. Yantar is becoming obsolete and they urgently need to modernize the galvanizing shop and improve the docking area. Additional investments are required to shift production from military orders to civilian orders.

I am already not talking about the construction of housing, schools and children's institutions.

Yes, the plant has real prospects to survive and to preserve production and cadres. But still Leonid Yanuaryevich's words do not leave my memory: "Life has forced us to look for work in the civilian shipbuilding field. But does the state really not understand that it is impossible to have a country like Russia without a strong and modern Navy?"

Conversion: Aviation Engine Building Industry

93UM0355A Moscow *TEKHNIKA I VOORUZHENIYE*
in Russian No 11-12, 92 pp 2-4

[Article by Academician N. Kuznetsov, general designer at the Trud Samarskiy Scientific Production Association, and Professor V. Orlov, doctor of technical sciences and chief designer at the Trud Samarskiy Scientific Production Association: "Converting Aircraft Engines into Industrial Engines"]

[Text] The national economy's need for a considerable number (in the hundreds) of gas-pumping units, gas-lift stations, and power plants is putting forth increased demands on conserving labor and material costs for creating them. From this standpoint, converting aircraft engines to industrial engines has its advantages, since it makes it possible to draw into the national economy those which have used up their service life in aviation. In addition, use of an aircraft engine significantly reduces the capital outlays for production of stations and assemblies, since there is no longer a need to build special housings for them: all the equipment necessary for this is contained in the container.

The Trud Samarskiy Scientific Production Association [SNPO], which belongs to the Union of Aircraft Engine Building Association [ASSAD], has amassed a large amount of experience in designing and producing aviation-type gas-turbine engines of the NK family for the gas and energy industry. Converting aircraft engines into gas-turbine plants [GTU] to drive blowers of gas-pumping units [GPA] and electric generators is accomplished on a traditionally high level of engineering and production technology of military and civilian aircraft engines, which ensures reliability and durability of products, a consistently high manufacturing quality, and similar thermo- and gas-dynamic parameters.

Various conversion arrangements were analyzed for turbofan-type aircraft engines. However, calculations showed that the greatest horsepower is achieved if the base variant is transformed into straight-through engine. Therefore, the power turbines for driving the blower or electric generator had to be created anew. Selection of the determining parameters (number of stages, degree of reactivity, rotational speed, and output speed) was based on the condition of achieving maximum efficiency of the gas-pumping unit. To transfer torque, it was decided to use a membrane coupling which allows limited canting and misalignment of the turbine shafts and blower. In addition, its design makes it possible to disassemble easily and quickly the blower's bearings and its seals or the electric generator (without disassembly of the pressure bulkhead of the turbo-unit container), which considerably simplifies repair and maintenance work when during servicing. There is a splined safety connection to prevent spin-up of the power turbine in the event of failure of the membrane coupling. It is possible to balance the turbine rotor on its own bearings, which ensures a stable and low level of variable stress in it.

It is also possible to mount and dismount both the entire plant (engine and power turbine) on frames equipped with rollers and the power turbine or engine. Thanks to this, the entire drive can be replaced in one or two shifts, while repair of stationary plants requires 20-30 days. It has become possible to perform a major overhaul at the plant, which considerably improves its quality, does not require arranging for special rooms at stations, and ultimately increases the availability factor of the drive.

During the planning process, design solutions were found which make it as easy as possible to align the drive. Rough alignment can be done by moving the entire engine, and precise alignment can be done with the help of special wedges at attachment trunions of the power turbine. For convenience of operation, the connection assemblies of the pipelines and power cables of the drive engine with the corresponding assemblies of the gas-pumping unit or electric generator are concentrated in one place and attached to the frame. The engine's closed lubrication system is independent of the same system of the unit. The oil is air-cooled (using a heat exchanger located in the block of the gas-pumping unit).

Important conditions when designing aircraft engines are a high degree of automation of control and a ramified system of monitoring the serviceability of assemblies, which to a considerable extent was used when converting the engines and created the basis for complete automation of both individual units and complexes as a whole. Starting of the engine has been completely automated. To preclude accidents, there is a protection system which automatically prevents an increase in parameters over and above threshold values. It consists of several limiters. They all (except for the starter rotational speed and gas generator maximum turbine temperature limiters) are hydromechanical; therefore, they function even without electrical power. This is extremely important, since about 75 percent of the unplanned stoppages are due to interruptions in electricity. Blocking is provided to prevent starting of the engine in the absence of an electrical power supply.

Specialists of the association have proposed to determine the life of a gas-turbine engine with the help of equivalent-cyclic accelerated tests, which make it possible to test individual parts and units in shorter periods of time for running in more severe conditions than envisioned during operation. For example, the life of the blading of a turbine stage equal to 45,000 hours (more than 5 years of continuous operation) can be checked in 200 hours (without taking into account erosion wear).

Using the converted aircraft engines as part of gas-pumping units has a number of significant advantages compared to using stationary gas-turbine plants. They weigh 7-10 times less than the stationary ones. It is possible to organize servicing maintenance in which the engine is repaired at the plant. Using modular-type gas-pumping units has made it possible to decrease capital investments 30-40 percent for construction of

compressor stations and to reduce by a factor of 2-3 the volume of construction and installation work.

Presently, the concern Gazprom is using at compressor stations more than 817 GPA-Ts-6.3 units with the

NK-12ST engine and 427 GPA-Ts-16 units with the NK-16ST engine with a total output of 11.5 million kW, which is one-quarter of all the gas-pumping units and about 32 percent of the capacities of the fleet of gas-turbine units.

Aircraft Engines of the NK Family

Parameters	Series-Produced		Experimental				
	NK-12ST	NK-16ST	NK-14ST	NK-36ST	NK-37	NK-38ST	NK-39
Output, kW	6,300	16,000	8,000	25,000	25,000	16,000	16,000
Effective efficiency, percent	24.5	29.0	32	36.4	36.4	38	38
Power turbine rotational speed, RPM	8,200	5,300	8,200	5,000	3,000	5,300	3,000
Pressure ratio	8.97	9.68	9.5	23.12	23.12	25.9	25.9
Gas temperature before turbine, K	941	1067	1203	1420	1420	1476	1476
Gas temperature at output, K	583	643	748	698	698	716	716
Gas flow rate at exhaust, kg/sec	56	102	37.1	101.4	101.4	54.6	54.6
Consumption of fuel gas, kg/hr	1820	4052	1900	5163	5163	3046	6043
Weight, kg	3500	7800	3700	8690	9840	5900	7200

The average efficiency of gas-turbine drives installed on domestic gas lines is 26.7 percent, while the leading world level of efficiency of gas-pumping units with converted aircraft engines is estimated at 33-36 percent. NK-12ST engines as part of a gas-pumping unit are being delivered under contract to Bulgaria, Argentina, and Poland. Variations of using the NK-16ST engines are being considered in Iran. The issue of increasing thermal efficiency of drive plants is also relevant in the energy industry, which is associated with the increase in the fleet of mobile gas-turbine electric power plants and the increase in their output. Special emphasis should be made of the fact that using more perfect engines as a part of power plants with recovery of exhaust gases in steam-gas plants will make it possible to increase the efficiency of such complexes to over 50 percent.

In order to conserve natural gas (as a fuel), a new generation of converted engines has been developed for piping gas over gas pipelines. In 1993, it is planned to begin operation of new GPA-Ts-25 gas-pumping units with a NK-36ST engine (25 megawatts and 36.4 percent efficiency) on northern sections of the main gas pipelines.

High-efficiency engines created at the Trud SNPO for use in the gas and energy industry include the NK-36ST, NK-38ST, their modifications NK-37 and NK-39, and also the NK-14ST engine, designed based on the series-produced NK-12ST (see table). Their assemblies and parts are made from materials being used in modern gas-turbine aircraft engines.

Engines of the NK family are noted for their high efficiency: the content of nitrogen oxides in exhaust

gases is 60-120 mg/m³ (the NK-14ST has them at a level of 120-130 mg/m³). This is approximately half the level allowed by state standards (GOST).

The experimental NK-36ST, NK-38ST, and their modifications, compared to the series-produced models, have a considerably higher pressure ratio and gas temperature before the turbine. These parameters determine the increase in concentration of nitrogen oxides in combustion products of a gas-turbine engine. Therefore, new two-zone combustion chambers are being tested for the NK-36ST and NK-38ST. In these chambers, the combustion process is accomplished in the area of "lean" mixtures, which will make it possible to meet GOST requirements. The level of oxides can be lowered significantly by injecting water vapor into the combustion chamber injectors, since the NK-37 and NK-39 are designed for electric power plants with a steam-gas plant.

Figure 1 [not reproduced]. The NK-12ST engine has been developed based on the most powerful and reliable NK-12 turbopfan engine, which is operated on the AN-22 and Tu-95 aircraft. It is being used as a blower drive of a gas-pumping unit, which has made it possible for the first time in the country to create a fully-plant-ready gas-pumping unit. This reduces significantly the time periods for putting compressor plants into operation. The engine is being used on 24 domestic gas pipelines in all climate zones and also abroad. The operating time of the leader engines without repair is as high as 60,000 hours.

Figure 2 [not reproduced]. The NK-16ST engine is designed based on the NK-8 aircraft engine installed on

Il-62 and Tu-154 aircraft. Its design borrowed 69 percent of the parts and assemblies of the base engine. This made it possible to create a highly reliable, compact gas-pumping unit that is small in weight and size. The operating time of the leader engines without overhaul exceeded 30,000 hours. The NK-16ST is simple to service. Inspection of its flow passage is accomplished with the aid of a baroscope without disassembly.

Figure 3 [not reproduced]. General view of a compressor plant with NK-16ST engines.

ASSOCIATION

The Union of Aircraft Engine Building Association, created in May 1991, combines 80 domestic and foreign enterprises whose sphere of activities includes the creation, production, repair, and servicing of aircraft engines and assemblies for them, power plants, and auxiliary plants for gas-pumping and energy units; piston engines for sport aircraft, motor vehicles, snow-going vehicles, light surface craft, motorized units or blocks, and mini-tractors; equipment for the light, food, and leather-shoe industries; and various household and medical goods.

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- an association of manufacturers and consumers which coordinates fulfillment of requirements imposed on engines throughout the life cycle. The association possesses a large scientific-technical and production potential and offers cooperation in the following directions:
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- testing of products and their components in a wide range of parameters and automation of experiments;
- calculating and analyzing characteristics of engines and their assemblies and units;
- drawing up planning and design documentation, conducting scientific research work for construction and modernization of enterprises for production of aviation equipment and enterprises specializing in general machine building;
- organizing joint production facilities for manufacturing domestic and foreign aircraft engines, power drives, and units and individual assemblies for them, and also for maintenance servicing of aviation equipment;
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Sukhoi Chief Designer Babak Interviewed

93UM0312A Moscow KURANTY in Russian
No 225, 26 Nov 92 p 6

[Interview with Design Bureau imeni P.S. Sukhoi Chief Designer Vladimir Petrovich Babak by KURANTY Correspondent Yuriy Voinov: "Aircraft Are the First Priority"]

[Text] Today's defense complex problems with its mighty industrial and intellectual potential somehow or other affect all of us. Right now there is much criticism directed at the defense industry. But the view of a man from inside is interesting. For Design Bureau imeni P.S. Sukhoi Chief Designer Vladimir Babak the following remains the primary principle even in the current difficult time: Aircraft are the first priority.

[Voinov] Vladimir Petrovich, SU is a firm with a world reputation. The International Airshow recently occurred at Farnborough. What was interesting there?

[Babak] The airshow that occurred demonstrated that as of today we have outstripped the West in many ways. This especially pertains to the SU-27 and MIG-29. We have shown the world that we are worth a lot and they need to respect us. As a result, proposals were extended to us on cooperation and buyers also appeared.

[Voinov] Which of our aircraft were exhibited at Farnborough?

[Babak] The Design Bureau imeni Sukhoi exhibited more than ever before—eight models. They are both the SU-27 fighter, the SU-24 reconnaissance aircraft, the SU-25 ground attack aircraft, the SU-29 sports plane, and the SU-35 future aircraft. Besides our design bureau,

Mikoyan, Tupolev, Antonov, Yakovlev and Kamov firms exhibited their aircraft.

[Voinov] Until recently, you worked based on state plans. All of our aircraft design and military cooperation policy was decided "up above". How independent are you now?

[Babak] In the period of Soviet rule, we lived and worked under conditions of competition with the Western military-industrial complex. And during that time we developed our own very high class complex and we continued to grow. We ourselves selected for ourselves the most talented and knowledgeable specialists, we received money from the state budget and we worked calmly.

If the question arose about the sale of our arms abroad, the decision was made in the government.

Right now we have run aground. We have been cast to the whims of fate. Some old orders from the Ministry of Defense have remained but they are catastrophically few. Furthermore, right now ties that were established over the years have been destroyed. Design bureaus, series production plants, and related industries—everyone has turned out to be uncoordinated.

[Voinov] But the demand for your aircraft has remained?

[Babak] There is demand. But we don't know how to sell them ourselves because we were never involved with that. In order to survive, we are beginning to seek customers who are interested in our aircraft. As everywhere, there is an enormous mass of middlemen in the arms market through whom we find a buyer.

Now we ourselves are going to the Ministry of Foreign Economic Relations and we are seeking authorization to sell aircraft. In the process, we must pay a certain percentage from the deal. This is proper in general. We are still selling arms and there must be state monitoring here.

The Americans dominate the arms market right now and they are doing everything possible in order to prevent a serious competitor like us. I have recently conducted an enormous number of negotiations both with buyers and with middlemen. But the entire deal falls apart at a certain stage. There is a continuous restriction of the "Russian bear in his lair". And this is very serious. If we don't manage to penetrate the market, we will perish.

[Voinov] But your prices are lower...

[Babak] Yes, they are lower, although that low price is quite a lot for us. But an aircraft has to be maintained in service for 20 years. Repair, spare parts and consultations are needed. And right now we can guarantee none of that. We have delivered our aircraft abroad for a long time. Right now they are demanding spare parts from us. To whom can we turn? No one knows.

[Voinov] Well, right now it has become more difficult everywhere...

[Babak] Yes, in general right now it has become impossible. Right now a new law or edict is expected every day. Amateurs are making plenty of profits at the expense of the defense industry, although right now our salaries are lower than any maid's. What is this—a chief designer's salary—8,000 rubles? And suddenly tomorrow the Supreme Soviet will decide in general not to give money to the defense industry because the people are hungry. Then another sea of people who will be just as hungry will be put out into the street.

[Voinov] Its as if right now we have arrived at the issue of conversion.

[Babak] I want to say that defense plants have always been tasked with the production of consumer goods. At some plants up to 50% of capacity operates on consumer goods. The assortment is also unusually broad—washing machines, launches, bicycles, and wine presses. And I categorically do not agree with those who say that the defense industry is not involved with consumer goods.

It is another matter that the design bureau was not previously enlisted in the problem of conversion. But we have also recently begun to become involved with it. At our design bureau, we have developed designs for high-class washing machines and for sports bicycles. But... You understand that we are specialists with the highest skills and we cannot waste our energies on such things. All our lives we have made and we must make aircraft. Let them be not military, let them be civil, although right now it is even more difficult to sell civil aircraft. The state is not financing us. Aeroflot is unprofitable and commercial structures cannot loan us money for the long term. We have several designs of small business-class aircraft. But five years must pass from design to series production and God only knows what will happen during that time.

[Voinov] Vladimir Petrovich, there was the Union, one state, one army. Now there are 15 states and 15 armies. And all of them have our aircraft, yes and now partners in various countries.

[Babak] I think that we need to unite in order to survive in this current difficult situation, initially based on the industrial principle. Six months ago when we finally collapsed and financing was terminated, I assembled the directors of 47 plants with whom we worked and I proposed that we unite. We created "Shturmoviki Sukhogo" [Sukhoi's Ground Attack Aircraft] Scientific Production Concern and now we are all involved with the production of the SU-25.

Primary assembly is occurring in Tbilisi, after that the aircraft flies to Russia where we totally complete it and prepare it for sale.

[Voinov] Right now the former Union is engulfed by military conflicts. Not only government troops but also

numerous illegal formations who have serious weaponry are participating in them. Are you receiving sales proposals from those people?

[Babak] We are receiving them. They have already arrived several times. I say: you need—to go see the government and if it authorizes it, please. We even require foreigners to request an end user certificate from the government and the moral aspect is doubly important here at home.

[Voinov] But do you feel that you are an accomplice in the deaths of people, not only military but also peaceful people?

[Babak] I will frankly state: I am very ashamed. I don't sleep at night because of that. I am ashamed before my children when I hear that a SU-25 has once again participated somewhere. To what state have we sunk in order for combat aircraft to take off into the air! They are people who are not at all thinking about the consequences. But, on the other hand, the development of new aircraft, including military—this is the embodiment of leading thought, this is such creativity as a creative artist. We invent such things from which we ourselves become happy. But an aircraft, that is so heavy but also flies. We are professionals...

Impact of Treaty on 'Start' Design Bureau

93UM0338A Moscow KOMSOMOLSKAYA PRAVDA
in Russian 13 Jan 93 p 2

[Article by V. Sanatin: "How Many Warheads Are Needed for Happiness?"]

[Text] Yekaterinburg—The terms "Molniya" and "Energiya" say a lot to the average Russian citizen. Behind the modest names of the firms is the gigantic figure of Sergey Pavlovich Koroleva, the first breakthrough to space, and the construction, launch, and operation of domestic orbital spaceships and stations.

But no Russian citizen had the right to know what was behind a number of aviation and space achievements of their Fatherland under the term "Start." The small machine building design bureau near Yekaterinburg became known when Mr. Ronald Reagan put an end to it....

Yes, the signature of the former American president is first under the "agreement between the USSR and United States on the elimination of medium and short-range missiles." The second signature is that of the former General Secretary of the Central Committee of the CPSU Mikhail Gorbachev. And the date: "8 December 1987."

It is now time for a little jubilee: it has been 5 years since we counted on the international diplomatic and political weight of the last general secretary of the best system of cruise missiles in the world. This was the RK-55.

"Start" started in 1949. This is no longer a baby that can be thrown out with the water. The bureau was conceived as the leading center for the development of the ground equipment of all kinds and types of flying machines: aircraft, guided projectiles, and missiles. Without "Start," the Soviet Army would not have received the postwar multiple rocket launchers that were later improved into the "Grad" mortars. Its naval aviation and ships with rockets on board would not have been able to test and service this equipment and all of this power and all of the dependable equipment called upon to protect the borders would not have come into being without the participation of "Start" in the Urals.

Without the intellectual efforts of the people in the Urals, the country of the soviets would not have put into space the multiple-mission space shuttle "Buran."

Can you now imagine what the design bureau "Start" is? What intellect of the nation was concentrated and shone here for 43 years! The 1987 treaty on the elimination of medium-range missiles, the disintegration of the Union, and the dispersion of the Soviet Army to the separate nations—all of this led to the decline of "Start." According to different information, military orders amount to 20 to 50 percent. But the international veto of the main subject—RK-55 cruise missiles—forced the best engineers, testers, electronics experts, and welders to leave the enterprise. A significant share of the highly intellectual work force has been lost.

"Start" is trying to survive through an independent conversion program. Here it is planned to set up small shops for the production of new kinds of building materials. The design bureau offered motor vehicle drivers facilities in a short time for the conversion of freight and passenger motor vehicle transport to liquified natural gas. The technology is being developed for the processing and instantaneous freezing of vegetables, fish, meat....

The first foreign journalists who visited the declassified design bureau are discussing a new "profession" of "Start" and, with romantic enthusiasm, presenting what happened as an inimitable example of the collapse of the totalitarian communist colossus. They are seconded by ours....

At the same time, everyone is forgetting that the level of scientific-technical thought of some state or other cannot be either capitalist or communist. The level can be low or high, backward or up-to-date. From this point of view, the end of such centers of thought and production as "Start" does not fill me with delight.

What did we get from the policy of rapid disarmament and the diplomacy of open windows and doors? Are our store counters loaded down with consumer goods produced by the former defense industry? Not at all! A cruise missile has nothing in common with a vacuum cleaner, although both have screws, coils, and a motor.

No defense enterprise of the United States and no subdivision of the Pentagon ever planned and carried out an 80 or even 100-percent conversion, as happened here. In Moscow, everything happened our way, as the Kremlin wanted....

The military people almost lost their minds when out of the sleeve of Ronald Reagan opposite the division "Latest Developments of the USSR" appeared the geographic coordinates of the "Start" design bureau in the Urals with an accuracy down to half a meter. And the advisers of the general secretary of the CPSU Central Committee were so obliging that they gave the American side not only the actual boundaries of the enterprise but also the plans for a possible building project. As a result, the American inspectors looked for cruise missiles in the shops as well as beyond the fence of the design bureau, in houses, in firewood yards, and in garages and chicken coops of the private sector, scaring to death pensioners who were not guilty of anything. Professional military people would never do such a ridiculous thing with RK-55 cruise missiles or put them under an oxyacetylene torch—there were no better systems in the land theater of military operations either. In contrast to the "Pershings," our system had six rather than four warheads. At the same time, the launcher was maneuverable, mobile, and self-propelled. As for the electronics and guidance, this was the latest, newest, and most reliable development....

The first batch of the latest weapon—84 missiles—was destroyed, as were the launchers. The Americans were so concerned about the success of the work that they demanded that the hooks be cut off the rear of tractors of the "Uragan" type so that the Russians, God forbid, would not hook up a peasant cart with a nuclear warhead.

So they brought "Start," which was about to go into space, back to earth. It was something similar to the end of the American spy Powers, who on 1 May 1961 flew his U-2 precisely over the roof of this secret design bureau near Sverdlovsk but who fell to a foreign land 20 km farther on. It was precisely then that the Americans first sensed what kind of high-class missiles the "clumsy ursine Russian thining" was capable of inventing and deploying. But the "new thinking" was able to do what Powers could not.

At first glance, there is nothing to be sorry about here. Why do we need dependable missiles now? Whom are we supposed to intimidate? They no longer fear us in the West. Nuclear China wants to be good neighbors....

I too assert: there are two worldwide evils—weapons and AIDS. But no one has yet thought of fighting AIDS by castrating lovers. No right-thinking country in the world is renouncing the improvement of its arms, both conventional and nuclear. Is it possible that they have not grown to the point of the "new thinking"? Are we stupid and

trying to get them to be peaceful, while they are preparing for war? Nothing of the sort. All of the others are preserving the concept of the "strong state."

There is no state program for conversion. And the population cannot afford independent conversion in the oblasts, cities, and rayons. It is ruinous and sometimes simply stupid. They are stamping out pliers and hammers but you cannot find a nail in the store. They are making ironing boards but try to buy an iron. Of course a maneuver in the market is not the "hup, two" of the generals. Here you need to have more than the convulsion from the service cap.... Shock conversion and the rushing of the doomed around the market does not at all suit our clumsy industry with its selfish departmentalism!

They in the West knew very well what we lose in an avalanche-like conversion. I am not even talking about money. So we destroyed 84 missiles and buried about \$225 million. Good riddance! We are a country of very rich possibilities. But in our zeal to make peace, we did not notice that the dollar is getting stronger and the ruble weaker. And we will forget and forgive ourselves this mistake for the sake of friendship on earth. But we did not comprehend that with the beginning of shock conversion in such oblasts as Perm, Sverdlovsk, and Chelyabinsk and throughout all the Urals and Siberia we are losing kindergartens, Pioneer camps, recreation bases, polyclinics, stadiums, sports centers, swimming pools, houses of culture....

And the leadership of the "Start" design bureau is not hiding the fact that the best personnel, men up to 45 years of age, are leaving the enterprise. Women of all ages and people expecting a pension are holding on to jobs in various auxiliary sectors. Highly skilled welders capable of working with metals of all kinds and colors went to "Vtorchermet" as ordinary gas cutters. The people began to receive 16,000 to 20,000 rubles [R] a month for their new work.... And the authorities, local and otherwise, somehow resigned themselves to the fact that specialists in highly precise and high-strength welding were lost to Russia. They should have paid them R200,000 a month! But the "reformist" phenomenon in Russia is awful: here they do not pay any attention to professionals and sometimes they openly despise them. They can offer packing work at a tobacco factory to the creators and testers of the best equipment in the world for aircraft. But today not a single labor exchange and not a single job-placement office will offer these people work up to their intellect. There are no such jobs! Russia does not need intellect.

An 80 to 100-percent conversion is murderous for professionals. Here no first-class welder or electronics expert can go from defense production to civilian service without thereby losing his grading entirely. A superprofessional will inevitably become an assembler, a fitter with a sledge hammer, or an electrician with grapplers for climbing posts like a monkey....

Here the international spell of the first person was always worth as much as a sovereign person independent of the people and state "can swallow." In just 2 or 3 years, we pledged our own industry in the pawnshop of pleasant international meetings and put our own economy under hundreds of points of all kinds of international vetoes. But when we realized what had happened, we saw that there is no master who would redeem such a valuable thing for the entire society from the pawnshop!

In reality, despite the talk of a great Russia and its restoration, we can already forget about the Russia of Tsiolkovskiy, Kurchatov, and Korolev. At the "Start" design bureau, they were building a shop for the testing of equipment for all kinds of aircraft, including for the "Buran" program. Now, right after the team of American military inspectors, civilian partners have appeared at the design bureau. The American firm "York" has agreed to invest \$50 million so that the people at the design bureau will not test any more cruise missiles and so that the new shop will manufacture equipment for the refrigeration of milk. In Russia, the Americans have the least expensive manpower and unbelievably cheap metal. A contract on intentions has already been signed by "Start" and the government of Sverdlovsk Oblast and the Americans are happy.

Yes, thanks to this partnership "Start" avoids the problem of unemployment to some extent. Thank you, foreign friends! But there is also another way of looking at the problem. Having destroyed a potential adversary for 225 million greenbacks, Uncle Sam is returning \$50 million to it, whereby he is also obtaining the right to exploit the most qualified and most valuable manpower in Russia.

Everyone should invest in conversion! But where are all of these people? The state has no time to deal with the retraining of production. The state is fighting inflation, whereby it is doing so in a unique way, continuously raising up bureaucrats and transplanting them from ministries to departments and from departments to consortia.... They in "Start" had hardly developed a conversion program for the manufacture of the most up-to-date equipment for the Russian timber industry when everything turned over. The country no longer has such a ministry!

The people at "Start" said good-bye to forestry and made friends with aviators. They decided to help the people at Tupolev to convert their aircraft to the use of liquified natural gas as fuel. They took on the development of liquefaction mechanisms, the construction of reservoirs for the new kind of fuel, and the equipping of airports with refueling pumps and mobile fueling units. No sooner had they received the first appropriations when the Ministry of Aviation Industry disappeared!

I want to wish that "Start" will not become perplexed and that it will survive. I do not know how this can be done. The people at "Start" can continue to produce tents for winter fishing trips.... That is something that is

in demand! But I personally made myself a winter fishing tent in my kitchen out of ski poles and I did not have the capability of constructing cruise missiles and spaceships.

"Start" can earn money making gas installations for drivers and it can become a technical center for the processing of sawdust, vegetables, milk, and even American corn meal into Russian wheat meal. But this can no longer be the space age, intellect, and merit of a sovereign and independent Russia.

Do you want to argue with me? Promise that my children will not stand in line for an imported loaf of bread made of corn and soy beans, as happened to me in the 1960's during the time of the Caribbean crisis and the equally hasty conversion following the pounding of the Russian shoe against the political platform of the United Nations.

Bulavkin: Doubts About Conversion of Military-Space Industry

*93UM0344A Moscow KRASNAYA ZVEZDA in Russian
23 Jan 93 p 3*

[Interview with Tekhnomash Scientific Production Center General Director Vyacheslav Vasilyevich Bulavkin by KRASNAYA ZVEZDA Correspondent Mikhail Rebrov, under the rubric: "The Defense Complex": "Vyacheslav Bulavkin: 'In Our Country They are Confusing Conversion With Degeneration'"]

[Text] Vyacheslav Vasilyevich Bulavkin is General Director of Tekhnomash Scientific Production Center—the head center for the development of technologies and equipment for the manufacture of missile-space systems in Russia. He is an active member of the Academy of Technological Sciences and the Russian Federation Engineering Academy and a laureate... I drove out to see him in order to interview him about Tekhnomash's current business. However, from the very beginning, the conversation occurred on a broader circle of subjects.

We met in his office at the very beginning of the work day but the director had already managed to conduct difficult negotiations with "creditors". On the walls—are tables and schedules, on the shelves—models of items, on the desk—technical documentation, and over his head—a portrait of S.P. Korolev: Vyacheslav Vasilyevich has worked as the main technologist at missile-space sector enterprises for many years.

[Bulavkin] Yes, that same sector, that today at the everyday life level, so to speak, is perceived by many people as nearly some sort of monster that swallows enormous resources, without providing anything in exchange.

[Rebrov] Alas, Vyacheslav Vasilyevich, this perception has been formed in the public consciousness about the VPK [military-industrial complex] as a whole... And we admit that it hasn't been formed out of thin air. For decades, approximately 80% of national resources, raw

material, technological, financial, intellectual resources—were spent for the development and maintenance of the military-industrial complex...

[Bulavkin] But you must also see something else. The defense complex, including the missile-space sector, absorbed into itself everything that was the best in the country, including the main economic capabilities, the leading scientific-intensive technologies, the unique materials, and—the main thing—the specialists. It would be more accurate to say it like this: we did not absorb, we created. These technologies were conceived and developed in the military-industrial complex's scientific and production centers, highly skilled engineer-design cadres and our intellectual might were raised there.

Does everyone understand that? Unfortunately, no. It really appears to be an enormous machine that directly grinds up his hard-earned money into weapons to a person who is familiar with the defense industry only through hearsay. Hence the natural desire to close, reduce and reallocate all of this.

[Rebrov] But the desire about which you have spoken did not appear all of a sudden. The defense complex essentially became a synonym of our present day economy. Can we consider that to be normal?

[Bulavkin] Certainly not! But, I repeat, when they attempt to present the military-industrial complex as only an insatiable vampire on the people's body—that is not simply false but it is disinformation. Those people who sow it are silent on a quite important reality of our lives. Televisions, video equipment, photographic and movie equipment, bicycles, sewing machines and tape recorders—all of that is 100% of the defense industry's output. Further: 98% of refrigerators and freezers, 77% of vacuum cleaners, and 66% of washing machines... Aeroflot passenger airliners, light automobiles, tractors, and telephone sets... And now, imagine what we will obtain if all of this goes to the dogs as a result of "wholesale" conversion?

[Rebrov] Today there's a lot being said about conversion, everyone is hearing about it. However, followers of this problem express various views and opinions. But where is the truth?

[Bulavkin] The diversity of opinions is not surprising. Thinking people view any question from various points of view, while understanding that they can achieve little with an aspiration for uniformity. It is another matter that only that person who is deeply familiar with the defense industry's structures can understand its sore points. The opinions of bystanders are at times not only erroneous but also dangerous. The assertion that the possibility exists to obtain nearly an immediate effect from conversion without any additional efforts and expenditures whatsoever is absurd. Just as the assertion that the missile-space sector is the primary cause and the perpetrator of the current economic crisis.

[Rebrov] I agree. The problem is not as simple as it seems. Let's make certain provisions more precise on the example of Tekhnomash—the scientific and production center that is currently part of the Committee for the Defense Sectors of Industry and let's attempt to imagine what will happen if...

[Bulavkin] If they close it? Is that what you want to say? I will answer. The scientific laboratories and experimental production will close, and the skilled cadres will leave for commercial structures... And electronic beam welding (there are 20,000 meters of welded seams on the Energiya rocket alone), unique sealed designs (leakage—one gram in 10 years), soldering of various types of metals, special ceramics, various plasmas, pipeline pumping assemblies, the rotor of which is made from a monolithic "piece" and reliably operates at 50,000 revolutions per minute, new materials, honeycomb structures for the aircraft industry, diagnostic and control devices will cease to exist along with them... Can you imagine what that is?

And there are still approximately 200 types of know-how, including of the purely conversion context. I have in mind the food industry, medicine, and consumer goods...

[Rebrov] We would like to hope that this type of insanity, you can't call it anything else, will not occur.

[Bulavkin] Alas, if conversion is conducted using these methods and techniques that they are forcing on us, then it could become even worse. And that is what is especially distressing. Our association was generating new civilian technologies even before and it strove to ensure our industry's high effectiveness and competitiveness and to create a scientific technical basis for the most varied production. But today we are living in a world of paradoxes. A specific illustration are prostheses for disabled people. Do I need to say how painful this issue is. The well known space firm Energiya NPO [Scientific Production Association] has developed a design that is not only capable of competing with foreign models but will also exceed them. We have helped with technological equipment for production. And the matter has progressed. A female marathon runner ran a 40-kilometer distance on this prosthesis. Twenty thousand such prostheses have already been manufactured but they are not being sold. The Ministry of Health and Social Insurance is standing on the sidelines. And materials, technical equipment, energy, and intellect have been expended on that work. Who will pay for all of that?

[Rebrov] It would be logical for the state, for that same Ministry of Health...

[Bulavkin] If only that were true. One more example. When the ministry of machine building for light industry and the food industry was being disbanded, more than 50 enterprises were transferred to the former MOM [Ministry of General Machine Building]. I visited many of them, saw the primitive equipment, terrible buildings, manual labor, and materials that did not meet standards

with my own eyes, and as a result of all of that—cheap and quite unreliable products. I am already not talking about its ecological cleanliness or competitiveness.

I want to direct your attention to the word "cheap". There must be no illusions here. Our developments, technologies and materials guarantee durability, efficiency, operating conveniences, and sterility. But if this is good and pretty, it cannot be cheap.

Understand that the most modern technologies are being utilized for the production of missile-space equipment. Therefore, conversion cannot be oriented on a transition to technologies of a lower level. It is more difficult to manufacture spacecraft than to manufacture a production line to produce sausages.

Tekhnomash has a high technological potential, there is an opportunity to access the international market and to become integrated in the international system. And real steps are being made in that direction, but... Once again that notorious "but".

Conversion is difficult and largely a painful process. You can't carry it out through directives and strong-willed decisions alone. Profound scientific calculations, credits, and state orders are needed that support the country's interests and its national economy and also the enterprises themselves and the sector's scientific center. We need carefully thought out legislative acts. Without serious consideration of the social factors, conversion will turn out to be negative economic and socio-political processes, unemployment, a reduction of the prestige of the labor of the skilled intellectual elite, a "brain drain", and an increase of social tension. And here competence, and not oral speculation, is important. It is too expensive, if not to say suicidal, to conduct this important matter for the state and its economy through trial and error. We have already made enough errors—it is time to learn from them.

[Rebrov] Today you can hear that the most convenient method to raise the economy is arms exports. We could sell nearly \$5 billion worth of arms per year...

[Bulavkin] You can sell everything. You only have to have goods that are competitive and, excuse the fervor, everlasting. So, today new technologies are those "everlasting" goods. The defense complex is capable of creating them frequently at the world level. How sad it is that we are not at all a great power or even a normal power in the spheres of consumer goods, food, roofs over our heads, purity of drinking water and the surrounding air. And as for, say, missile-space technologies, America itself largely envies us. Not only Japan, France, and the FRG [Federal Republic of Germany] obtain ideas and manufactured structures from us. But not for free. And not always in the proper manner. This is also a problem for a separate large conversation...

[Rebrov] What kind of future do you see for Tekhnomash under these conditions?

[Bulavkin] I will not dare to guess. Right now it is difficult to predict even six months ahead. Despite everything, we will strive to multiply new technologies, to increase their scientific-intensiveness, and to seek ways for more large-scale introduction into the most varied sectors. We are prepared for the broadest cooperation on a mutually beneficial basis...

[Rebrov] Vyacheslav Vasilyevich, they frequently call people of your generation and of your rank "red directors". How do you relate to that?

[Bulavkin] Quite calmly. What does "red" mean? I understand what "black" is. And remember: they are not appointing directors from above right now, they are selecting them on an alternative basis. Today people want to work and earn a good salary. We need to give them both. The question is: where do we get that? That is how a director must twist in order to justify the mandate of trust. And the color means nothing here...

[Rebrov] And the last question, Vyacheslav Vasilyevich, is age-old: what do we do? You can't maintain the same "twisting" for a long time.

[Bulavkin] We do our business. And first of all we prevent the reduction and, on the contrary, increase the financing of science and technological developments of a dual—civilian and military—purpose. Utilize the intellectual potential of the defense complex for design, production and introduction of super-modern systems for the production of consumer goods. These conversion programs must occupy a special place in Russia's state-wide and regional socio-economic development programs. And, naturally, we must not lose time...

Privatization of Aviation Plants Announced

934E0384A Moscow *EKONOMIKA I ZHIZN*
in Russian No 6, Feb 93 p 14

[Informational bulletin in the Russian Federal Property Fund weekly newspaper REFORMA, No. 5 (25), 1993, in the "Steps of Privatization" column]

[Text]

Public Joint-Stock Company Foreign Economic Association Aviaeksport (VO Aviaeksport) Communicates:

In conjunction with the privatization of the VO Aviaeksport, a private subscription is announced for the ordinary stock of the company, sold on preferential terms according to the second version of preferences, in keeping with the State Program for the Privatization of State and Municipal Enterprises in the Russian Federation in 1992 and Edict No. 721 of the president of the Russian Federation, dated 1 July 1992.

The following are the individuals who are entitled to take part in the private subscription to the stock of the VO Aviaeksport (henceforth referred to as participants in subscription):

- employees for whom the enterprise being privatized constitutes the main place of employment;
- former employees of the enterprise who, in keeping with the legislation of the Russian Federation, are entitled to return to their previously held jobs at the enterprise undergoing privatization;
- retirees who retired from the enterprise undergoing privatization;
- former employees of the privatized enterprise who accumulated a labor tenure of no less than 10 (ten) years for men, and 7.5 (seven and a half) years for women at the enterprise, and were laid off at their own request, by way of reassignment, or by way of authorized personnel or staff reductions;
- former employees of the enterprise undergoing privatization who were laid off at the enterprise in question after 1 January 1992 by way of staff reduction and registered as being unemployed.

Subscription participants should approach the working commission for the privatization of the VO Aviaekspost between 0900 and 1800 hours within 7 (seven) days from the date of publication of the present announcement in order to draw up and file an application to acquire the shares of the Joint-Stock Company Foreign Economic Association Aviaekspost at the following address:

19 Trubnikovskiy Lane, City of Moscow, Russian Federation. For information, call: 248-86-05, 248-86-00, 203-10-79.

The subscription is being held pursuant to the Statute on Private Stock Subscriptions in the Process of Privatizing State and Municipal Enterprises.

Subscription participants must have in their possession passports (or documents issued in lieu of passports) and employment record booklets in order to draw up and file the applications.

When an application is drawn up and filed through an authorized representative, the latter must have in his possession a power of attorney from the subscription participant certified through procedures established by the legislation of the Russian Federation, the passport (or the document issued in lieu of it), and the employment record booklet of the subscription participant.

The original capital of the Joint-Stock Company Foreign Economic Association Aviaekspost comes to 80,099,000 rubles [R];

- the number of ordinary shares distributed through the private subscription among subscription participants—40,852 shares;
- the nominal value of one share—R 1,000;
- the sales value of one share—R1,700;

- the number of shares which a subscription participant may request:

minimum—1 (one) share.
maximum—2,043 shares.

When an application is filed for a total (calculated on the basis of the nominal value of shares) which exceeds R90,000 (ninety thousand), a subscription participant must place a deposit with the cashier of the VO Aviaekspost, within the period of subscription, in the amount of no less than 50 (fifty) percent of the total application for shares (calculated on the basis of the nominal value of shares). In the process, no less than 50 (fifty) and no more than 80 (eighty) percent of the amount of the deposit should be paid by the subscription participant in privatization checks (vouchers).

Registration and the acceptance of applications to participate in private subscription to the shares of the Joint-Stock Company Foreign Economic Association Aviaekspost shall cease at 1700 hours on 19 February 1993

[Signed] Working Commission for the Privatization of the VO Aviaekspost

Shares of the Joint-Stock Company Motors of Perm for Privatization Checks

A check auction for the sale of the shares of the Joint-Stock Company Motors of Perm will open on 9 February. The Property Fund of Perm Oblast is announcing the postponement of the deadline for receiving applications until 11 March 1993 in conjunction with the establishment and opening of additional centers for the receipt of applications in many cities of Russia.

Some 237,125 ordinary shares (the nominal value of one share—R1,000) will be sold at the auction; this comes to 29 percent of the shares of the original capital of the joint-stock company. Privatization checks are the means of payment.

The characteristics of the Joint-Stock Company Motors of Perm are as follows:

- Joint-Stock Company Motors of Perm, 93 Komsomol Avenue, City of Perm 614010.
- The main types of products manufactured—aircraft and rocket engines, reduction gears for helicopters.
- The average number of employees on the payroll—35,000.
- The original capital of the enterprise—R817,671,000, divided into 817,671 ordinary shares. The form of share issuance is noncash, in the form of account entries.
- The area of the compound is 31,002 hectares. Characteristics of structures in the compound: production installations, buildings, houses.

—The Joint-Stock Company Motors of Perm is the founder of 14 enterprises (including those with the participation of foreign capital) and has shares in the capital of 21 enterprises.

—The Joint-Stock Company Motors of Perm has no intangible assets.

—The labor collective of the enterprise has opted for the second version of preferences.

Balance Sheet of the Enterprise as of 1 January 1993 (R1,000)

Assets	1 January 1993	Liabilities	1 January 1993
Fixed capital and investment	7,885,266	Sources of internal funds	8,438,398
Inventories and expenses	5,860,800	Long-term capital borrowings	3,772
Monetary funds, accounts receivable, and other assets	2,143,552	Accounts payable and other liabilities	7,447,448
Balance	15,889,618	Balance	15,889,618

You may familiarize yourselves with the privatization plan (the prospectus of issue), obtain additional information, turn in your checks, and draw up an application in the following cities:

Perm, 64 Lenin Street, the Commodity Exchange of Perm, (34222) 39-00-91; Moscow, Representative Office of the Joint-Stock Company Motors of Perm, (095) 923-41-80, 921-15-37; Moscow, Krasnopresnenskaya Embankment, Exhibition Center, Building 1, Entry S, 2d floor (the Auction Center); St. Petersburg (812) 123-87-04, 355-68-67; Novosibirsk (3832) 79-89-74; Nizhniy Novgorod (8312) 59-65-85; Kaliningrad (oblast [seat]) (01122) 45-95-50; Rostov-on-Don (8632) 58-01-05; Orenburg (35300) 3-10-65, extension 5-34; Maykop (87722) 3-09-10, 3-06-62; Yekaterinburg (3432) 56-22-36; Izhevsk (3412) 75-55-95; Tyumen (3452) 3-97-31; Ulyanovsk (84222) 36-95-98; Volgograd (8442) 31-75—51; Syktyvkar (82-122) 2-55-54; Chelyabinsk (351) 53-54-82, 21-92-34, extension 930; Samara (8462) 22-74-98; Lipetsk (0742) 77-85-44; Khabarovsk (4210) 37-26-82; Arkhangelsk (818) 69-92-26; Sochi, Astrakhan, Tambov, Kamensk-Uralskiy, Mineralnye Vody, Voronezh, Pravdinsk, Morshansk, Yuzhno-Sakhalinsk, Amderma, Omsk, Akhtubinsk, Bratsk, Norilsk, Komsomolsk in Tyumen Oblast, Monchegorsk, Gromovo in Leningrad Oblast.

You may obtain additional information about the operation of the centers for the receipt of applications in the above cities, at the Joint-Stock Company Motors of Perm, telephone (3422) 49-96-67, 49-91-29, the Moscow Representative Office at (095) 923-41-80, 921-15-37, as well as in the local press.

Within two weeks after the publication of a bulletin on the results of the check auction, the sale for rubles of the shares not sold at the check auction (not more than 12,000 shares) will begin, pursuant to Edict No. 1,705 of the Russian Federation president, dated 31 December 1992. Information about procedures for the holding of the money auction may be obtained from the Property Fund of Perm Oblast, at (3422) 32-49-60, or from the Commodity Exchange of Perm, at (3422) 39-00-91.

MiG Chief on Conversion Plans, Organization's Future

93UM0411A Moscow KRASNAYA ZVEZDA in Russian
6 Feb 93 p 3

[Interview with Academician Rostislav Apollosovich Belyakov, Twice Hero of Socialist Labor and chief of the MiG Aviation Scientific-Industrial Complex imeni A.I. Mikoyan, by Lt Col Valentin Rudenko, KRASNAYA ZVEZDA correspondent; place and date not given: "Mowers... Pear Cutters... Or Still MiGs... Should They Be Developed at the Design Bureau?"]

[Text] Readers certainly associate the MiG Aviation Scientific-Industrial Complex [ANPK] imeni A.I. Mikoyan with fast-wing fighters, many of which truly became a new word in world aircraft building. At different times they held 55 world records, 21 of which still stand. The Experimental Design Bureau imeni Mikoyan also surpassed Western designers in the development of a whole family of cruise missiles.

Twice Hero of Socialist Labor Academician Rostislav Belyakov headed the MiG ANPK in 1971. Incidentally, the first and only entry in his personal employment book was made long before the MiGs became an integral part of our life—in 1941 when he arrived at the design bureau as a rank-and-file associate after graduating from an institute.

Today the famous scientific-industrial complex, like the entire defense industry, is in a dramatic situation. Conversion, which lately has been called nothing more than a "landslide," has not bypassed it...

[Belyakov] Judge for yourself. Whereas beginning in 1939, that is, since the day it was formed, the design bureau has been involved exclusively with combat aviation, today already half of the work is being done in the interests of the national economy. There are about 15 civilian aircraft projects under way, including a supersonic business aircraft, a light cargo aircraft, and a multipurpose air-cushion vehicle. There are also agricultural aircraft and aircraft for local airlines, high-altitude basing, an aviation medical complex, a whole family of trainers...

[Rudenko] Impressive.

[Belyakov] I will tell you more. You could double or triple this list, but...having reduced military programs accordingly.

[Rudenko] From what I understand, won't this inevitably slow down the development of advanced equipment for the armed forces?

[Belyakov] That is just the point. Conversion of a design bureau and series production are absolutely differently things. For example, if they begin making sports aircraft instead of MiGs at some plant, the number of fighters in the armed forces will merely be reduced. But if a design bureau stops developing new combat aircraft, in the future the army may end up without any modern aviation at all. It is another matter whether combat equipment and armament should be made in the same numbers as before. Based on the present needs of the Russian Army, they certainly should not. But as far as developments are concerned...

Who can say how the situation in the world will take shape in the future? If our design bureau would not have had the MiG-3 fighter in reserve ahead of time, could industry have produced up to 30 of them a day during the Great Patriotic War?

I am not even mentioning the latest technologies that are being created and used in the defense sectors and ultimately will be projected to all of industry and the national economy. Look, what have we been making in the first, let us call it that, phase of conversion? Mowers, for example. A sort of necessary thing, but it did not go into series production. They figured it was too expensive. We developed a pear cutter. It won all competitions, but was produced in very small batches. We made a miniature cleaning machine for clearing sidewalks, but this also died down soon. Equipment for polishing leather, lines for conveying loose products, and shears for pruning grape vines did not fare much better...

We have expressed our concern with such, if I may say so, a course of conversion at the most various levels, but it was like a voice in wilderness.

[Rudenko] Some would categorize the way we are conducting conversion as almost a deliberate economic crime. Would you agree with that?

[Belyakov] Indeed, there are more than enough critical, outrageous problems with conversion. But I do not think they are the result of anyone's maliciousness. The reason for the many troubles is that the country lacks an integrated, well thought-out state regulation of these processes. Everything is left to take its course and farmed out to the enterprises and design bureaus. Experience has shown that this way is ineffective, since it will take a huge cycle and go far into the next century.

[Rudenko] Rostislav Apollosovich, everyone has already become used to the fact that practically every year you surprise the aviation world with some innovation. That

was the case at Farnborough in 1988 when the MiG-29, recognized as the best fighter in the world, was shown for the first time. That is what happened the summer before last at Le Bourget, where the MiG-31 was demonstrated. At the recent air show in England, you did not exhibit a new aircraft but a modification of the MiG-29—the MiG-29M. Will you have something to show in the future?

[Belyakov] First of all, I want to say that the MiG-29 and MiG-29M are qualitatively different machines. I will cite just one figure: in total number of missions it can perform, the MiG-29M surpasses its predecessor almost 2.5-fold.

As far as new modifications and new types of aircraft are concerned, we also have them. To tell the truth, I am not bothered by what kind of aircraft will fly tomorrow at Le Bourget, Farnborough, or Singapore, but what kind of aviation equipment our Air Force and Air Defense Aviation will receive. In connection with the breakup of the Soviet Union, the percentage of new fighters in Russia today is lower than, say, in Ukraine or in Belarus. My position is this: replace our fleet with new-generation aircraft, and mothball, salvage, or disassemble the old ones for spare parts, or sell them abroad. Incidentally, there are more than 5,500 of our MiGs abroad.

[Rudenko] Wouldn't it be wiser in the future to sell "excess" aircraft to other countries and use the money earned for implementing the same conversion programs?

[Belyakov] Of course, we are interested in selling our equipment. But we sense powerful resistance to this on the part of western countries. NATO Secretary General Manfred Woerner unequivocally stated that they should take every step necessary—political, economic, organizational—to prevent an increase in the quota on weapons being sold by Russia. So far they have been quite successful.

At the airfield of the MAPO imeni Dementyev, for example, we have standing under snow new MiG-29s worth nearly \$2 billion, and the sale of them is not moving, although there is a demand for these aircraft. I was told recently that one of the countries had expressed a desire to buy about 50 of our aircraft. However, according to my information, not a single MiG-29 was sold beyond the cordon last year.

I will note that the money earned by us personally from the sale of only two fighters would be enough both to implement the conversion programs and develop new models of combat equipment throughout the year. But for the time being the design bureau is on "starvation rations." Paradoxical as it may seem, a sufficient amount of money is being allocated for experimental design work. However, we are using only 40 percent of it. We return the rest to the budget in the form of taxes. And the taxes do not go for defense.

It is a pity that we now do not feel the proper interest on the part of the Air Force for what we are working on. I

could show you a completely new aircraft. It has already been made. We planned to put it into the air the year before last. We could not. There was no money to continue development of the engine.

You see, this aircraft and the engine planned for it are pioneers of new technologies...

[Rudenko] Aren't you really a budget organization?

[Belyakov] The design bureau is not considered such, since the budget is allocated to the Ministry of Defense, and the firm concludes contracts with it. But we actually are a budget organization. Our design bureau went to the government of Russia and the Ministry of Defense with a proposal to reduce the tax rate, to exempt from certain taxes enterprises engaged in scientific research and experimental design work, and to apply to them a system of preferential rates for payments in effect for budget organizations. But these proposals have not yet been implemented.

Today we are forced to pay our specialists not simply a low, but an intolerably low wage. Since October of last year it was only R10,000 a month, while it is substantially higher at series-production plants.

[Rudenko] With such an arrangement you cannot help but lose personnel.

[Belyakov] That is perhaps the greatest tragedy. Recently, an excellent programmer came up to me and said that his heart was with the firm, but he had to change jobs just to feed his family. He was to get R75,000 at his new job. Since 1 January 1991 we have lost more than 1,500 specialists.

[Rudenko] The army not only has a shortage of good aircraft but also good simulators. Many of them were made on a primitive level and entered service when the aircraft had been in operation for a long time. Won't conversion make this situation even worse?

[Belyakov] I hope not. Now it has been determined even by technical proposal that aircraft and a simulator complex for them are to be developed and delivered to the troops in parallel.

We consider the 30 hours of flying time that many pilots have today to be extremely low, since it does not ensure flight safety. The situation could be improved considerably with the help of good simulators. And we have them. In a model complex of a MiG-31, for example, pilots say they can practice missions better than on a flight itself.

However, we again need money to ensure that the troops receive a sufficient number of these simulators.

[Rudenko] But as long as there is no money for that and other things, will the military aviators have to pay for the costs?

[Belyakov] I can say with all responsibility that we will not reduce the requirements for the quality and reliability of the equipment being developed. This is ingrained in us. When a military pilot is asked what kind of aircraft he wants to fly, we have always strove and will continue to strive to see that he says he wants to fly a MiG. Our firm continues to consider itself responsible for fighter aviation. And we will not betray this duty and this attachment.

I once said that even if they forbid us to develop new combat equipment, we will find a way to get around this ban. The world is extremely unstable, and Russia must have reliable aircraft.

Kaunas Helicopter Repair Plant to Close as of April

934K0324E Vilnius LETUVOS RITAS in Russian
12-19 Feb 93 p 5

[Unattributed article: "Profitable, But Dangerous"]

[Text] More than 1,500 people work at the Kaunas shop of a helicopter-repair base of the Russian Army. The base, and that means the shop where the Kaunas residents work, will cease to exist at the end of April and beginning of May, according to the timetable for the withdrawal of troops—it will be removed from Lithuania. About half of the workers here have already received notification of dismissal.

The people, however, do not agree with this. The prospect of being on the street terrifies them. Barricading themselves in the shop and staying there around the clock, they have demanded that their jobs be saved.

An authorized representative of the government of Lithuania on issues of the withdrawal of the Russian Army, S. Knezys, told a BNS [Baltic News Service] correspondent that the evacuation of the base has already begun—repaired helicopters are being taken away. It is still not clear what will happen with the equipment.

The director of the military-repair base, A. Shulzenko, says that Russia would like to create a joint venture with Lithuania of a helicopter-repair type based on the existing production capacity.

A deputy of the Kaunas self-government, V. Stasaitis, feels that this would be a dangerous precedent reminiscent of the incorporation of Red Army bases in Lithuania in 1940. The realization of the proposal, on the other hand, promises no little gain. City Soviet Chairman V. Grynys says that a joint venture could be founded, provided that the fixed capital belongs to Lithuania.

Kolomna KB Offers 'Geo-Physical' Missile Based on SS-23

93UM0511C Moscow *TEKHNICA I VOORUZHENIYE* in Russian Mar 93 pp 46-47

[Announcement: "KB Machine Building Offers Geo-physical Rocket System 'Sphere' Utilizing Equipment from Eliminated SS-23 Missiles"]

The following forms of cooperation are offered to the possible partners abroad:

- rocket launchings and research as requested by the customer,
- rocket launchings for cooperative research programs,
- rocket launchings with customer's equipment,
- proportional development and series production of system components.

Transportability by different carriers, easy maintenance, and operation under a wide range of climatic conditions provide a wide choice of research areas.

Technical Specifications	
Type of missile	one-stage, guided, with solid-fuel engine
Guidance system	inertial, utilizing equipment from eliminated SS-23 missiles
Missile length	7.5 meters
Missile diameter	0.92 meter
Launching weight of the missile	up to 3,300 kg
Weight of the forward section	265-415 kg
Weight of the payload assembly	80-230 kg
Flight altitude of front section	—
—with a weight of 265 kg	330 km
—with a weight of 415 kg	275 km
Deviation from calculated trajectory at an altitude of 0.9 N max	no more than 1 km
Radius of the zone of impact	no more than 15 km
Time of microgravitation	450 seconds

The Guided Missile "Sphere" Gives New Scope for High-Altitude Experiments

- Measurement of atmospheric and ionospheric parameters in the area affected by exhaust products of heavy launching missiles.
- Measurement of local disturbance parameters in the upper atmosphere and ionosphere caused by natural processes or generated by previously launched rocket.
- Measurement of the upper atmosphere and ionosphere parameters affected by products of space vehicle operations (or by substances simulating these products).
- Modeling impacts of anthropogenic near-space contamination on space vehicle operations.

—Generation of large-scale ionized inhomogeneities in the ionosphere, their diagnostics on the route "space-earth."

For additional information with proposals, you can address:

Machinery Design Bureau Oksky Avenue 42 140402 Kolomna (Moscow Region) Russia

Telephones: (8-261) 3-75-05, 3-74-06.

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Space Instrument Firm to Market Specialized Items

Hi Tech Space Unit to Sell Locators, Sensors

93UM0459A Moscow *KRASNAYA ZVEZDA* in Russian 20 Mar 93 p 4

[Article by Valeriy Baberdin: "Millimeter Precision"]

[Text]

Space Firm Fixes Your Exact Location

The Scientific Production Association for Space Instrumentation (NPO-KP) is one of our leading firms involved in space activities. Until recently, this production facility bore the "secret" label. The label has been removed, and now the firm is open. The facility is diversified, employing highly qualified specialists working in the areas of computer technology, laser technology, high-frequency communications equipment, and a unique antenna equipment.

This is the place where "satellites were taught to fly," and the place of creation of guidance systems for automatic apparatus for use not only in near space, but also for investigating distant planets of the solar system, the Moon, and the Galaxy. Much was done to equip orbital stations and for ground control and telemetry complexes. Constituting the NPO are the Moscow institute NII KP [Scientific Research Institute for Space Instrumentation]; radio instrument factories located in Moscow, Kostroma, and Belgorod; and the Deep Space Communications Center in Ussuriysk.

Just what is being offered by these people, specialists, who spent their entire life "under the stars," dreaming about the far reaches of space? Well, quite a bit. One example is extremely precise navigation equipment. Imagine that you have installed in your car a display run by a computer which is linked with the GLONAS satellite system. Pictured on the display is a map of the area in which you are driving, with a map of a city. You can determine your position with an accuracy down to several meters and select the route that is most convenient for you.

And another example. How can a tunnel be dug through a mountain so that railroad tracks will meet? You set up

a device, then a second one. Flying overhead is a satellite. The precision here is one of millimeters.

The firm is developing emergency locator beacons which can be installed in automobiles, motor launches, yachts, and aircraft, or simply carried in a knapsack by someone headed for a trip to the mountains. The locator beacon will initiate operation in an emergency situation and, via the SARSAT-KOSPAS system, will transmit data to search and rescue services. There is another instrument. This one tracks freight, be the latter carried by rail, air, or sea.

It is common knowledge that all space technology is based on telemetry measurement. NPO KP specialists have a proposal for a specialized electronic system—the Tranzit K—which is capable of providing various kinds of data picked up from distant, mobile, and other objects which are difficult of access. What applications are there for this system? Proving grounds for motor vehicles and agricultural implements, poultry plants, animal husbandry facilities, and, finally, sports medicine.

The association possesses an excellent production base for creating modern microcircuits, printed circuits, and optical systems for laser technology. This is a base which is a source of amazement to Americans, Europeans, and specialists in the Land of the Rising Sun.

We invite all you entrepreneurs to become our partners. Have you any ideas?

Steel, Materials Firm Privatizing into Bulletproof Vests, etc

*93UM0459B Moscow KRASNAYA ZVEZDA
in Russian 20 Mar 93 p 4*

[Unattributed and untitled article under the "Supply and Demand" rubric]

[Text] The Scientific Research Institute of Steel is the leading firm dealing with research, development, and production organization of high-strength steels, alloys, composite materials, and polymer materials for application in demanding areas of transportation technology; and of systems of protection from mechanical, ballistic, and thermal effects, and from ionizing radiation. The high scientific level, modern testing and technological base, and pilot-scale production capability render the institute—as a joint stock company as of 17 February of this year—capable of independently setting up partnerships and selling the greater part of its products, many of which are unique. The latter include individual and collective protection means (bulletproof vests, helmets, radiationproof clothing, etc); explosion-proof technologies; service vehicles and bank equipment offering a high degree of protection; and ecological product development.

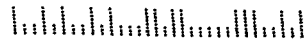
The address of the NII of Steel is: 127411, Moscow, ul. Dubninskaya, d.81a. Telephone: 485-35-10. Fax: 485-43-95.

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